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AD9152-FMC-EBZ Evaluation Board Quick Start Guide

Getting Started with the AD9152-FMC-EBZ Evaluation Board and Software

What's in the Box

- AD9152-FMC-EBZ Evaluation Board for ADS7
- Evaluation Board CD
- Mini-USB Cable

Recommended Equipment List

- Sinusoidal Clock Sources
- Spectrum Analyzer
- Oscilloscope
- Data Pattern Generator ADS7

Introduction

The AD9152-FMC-EBZ connects to an ADS7 data pattern generator system. The AD9152 is a dual JESD204B signal processing RF Digital to Analog Converter. The ADS7 automatically formats the data and sends it to the AD9152-FMC-EBZ via its JESD204B lanes. The AD9152-FMC-EBZ is an FMC mezzanine card. +12V, +3.3V, and VADJ power supply rails are provided by the ADS7 system via the FMC connector P1. A clock distribution chip AD9516 is included on this EVB as a clock fan-out and frequency divider for the DACCLK, JESD204B SYSREF signals, and a GBTCLK clock used by the ADS7. There is also an FMC standard I2C bus that is used by the ADS7 to identify the AD9144-FMC-EBZ. This I2C interface is implemented in software in the AD9152-FMC-EBZ PIC processor (XU1). All ADS7 to/from AD9152-FMC-EBZ interface signals are connected via the FMC connector P1.

AD9152 Evaluation Software

The AD9152 Evaluation Board software runs on the easy-to-use SPIPro graphical user interface (GUI). It is included on the Evaluation Board CD. Registers on the AD9152 and AD9516 products are programmed via a USB cable connecting the user's PC to the AD9152-FMC-EBZ XP2 connector. Software in the AD9152-FMC-EBZ PIC processor (XU1) provides the interface between the USB bus and the SPI busses of the AD9152 and AD9516.

Hardware Setup

A low phase noise high frequency clock source should be connected to the SMA connector J1, This is the DACCLK input. The spectrum analyzer should be connected to the SMA connector,J4 or J17. The evaluation board connects to the ADS7 through the connectors P3. The PC should be connected to the EVB using the mini-USB connector XP2 after installation of the Evaluation Board software. Figure 1 shows the block diagram of the set-up.

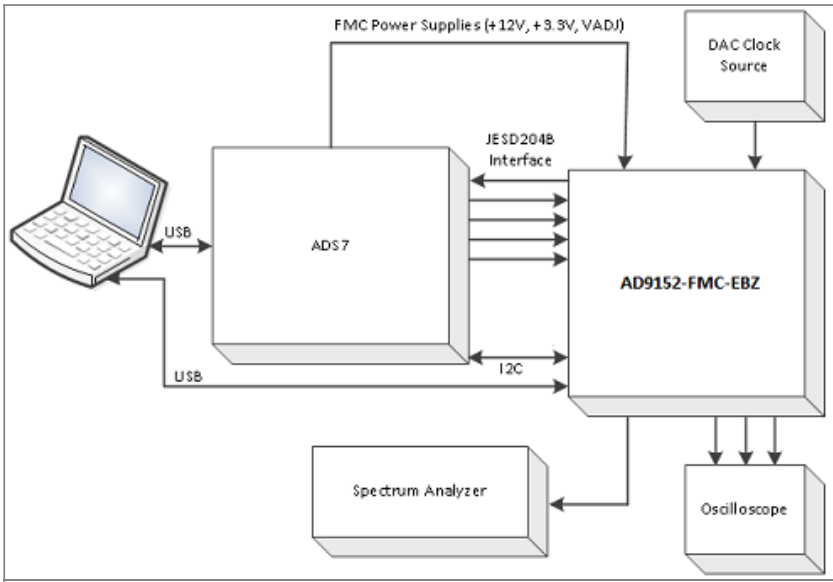

Figure 1. Block diagram of the AD9152-FMC-EBZ lab bench set-up

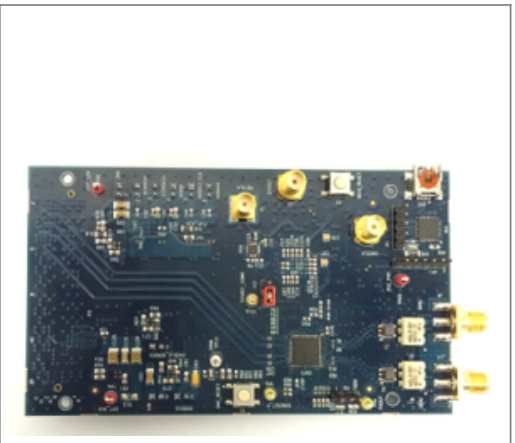

Figure 2. Top view of AD9152-FMC-EBZ

Getting Started

The PC software is included in the CD shipped with the EVB. The installation will include the DPG Downloader software as well as all the necessary AD9152 files including schematic, board layout, datasheet, and other files.

Initial Set-Up

1. Install the DPG Downloader and SPIPro software and support files on your PC. Follow the instructions in the installation wizard and use the default (recommended) installation settings.

2. Plug the AD9152-FMC-EBZ into port FMC_1 of the ADS7 System. Use a USB cable to connect the EVB to your PC and connect the lab equipment to the EVB as shown in Figure 1.

3. Connect the ADS7 unit to your PC via USB and turn on the ADS7.

Single-Tone Test

These settings configure the AD9152 to output a sine wave using the ADS7 and allow the user to view the single-tone performance at the DAC output, under the condition: Fdata = 375MHz, 4X interpolation, Fout = 100MHz.

Single Tone Demo Lab Bench Configuration Procedure:

Following settings configure the AD9152 to output a 100Mhz (-10dbFS) sine wave using the ADS7 on both 2 of AD9152 DACs.

- Configure the hardware according to the hardware set-up instructions given in the Hardware Setup section above. Set the frequency of the DAC clock signal generator to 1500MHz, and the output level to 3dBm. The spectrum analyzer can be configured as shown in Figure 6 with a resolution bandwidth of 30kHz. Choose an Input Attenuation of 10dB.

- On your lab computer, open the SPIPro application (Start > All Programs > Analog Devices > AD9152 > SPIPro). You will see the GUI shown in Figure 4 come up.

Single Tone Demo Hardware and Software Start Up Procedure:

1. Run DPG Downloader. It will say AD9152 as shown in Figure 3

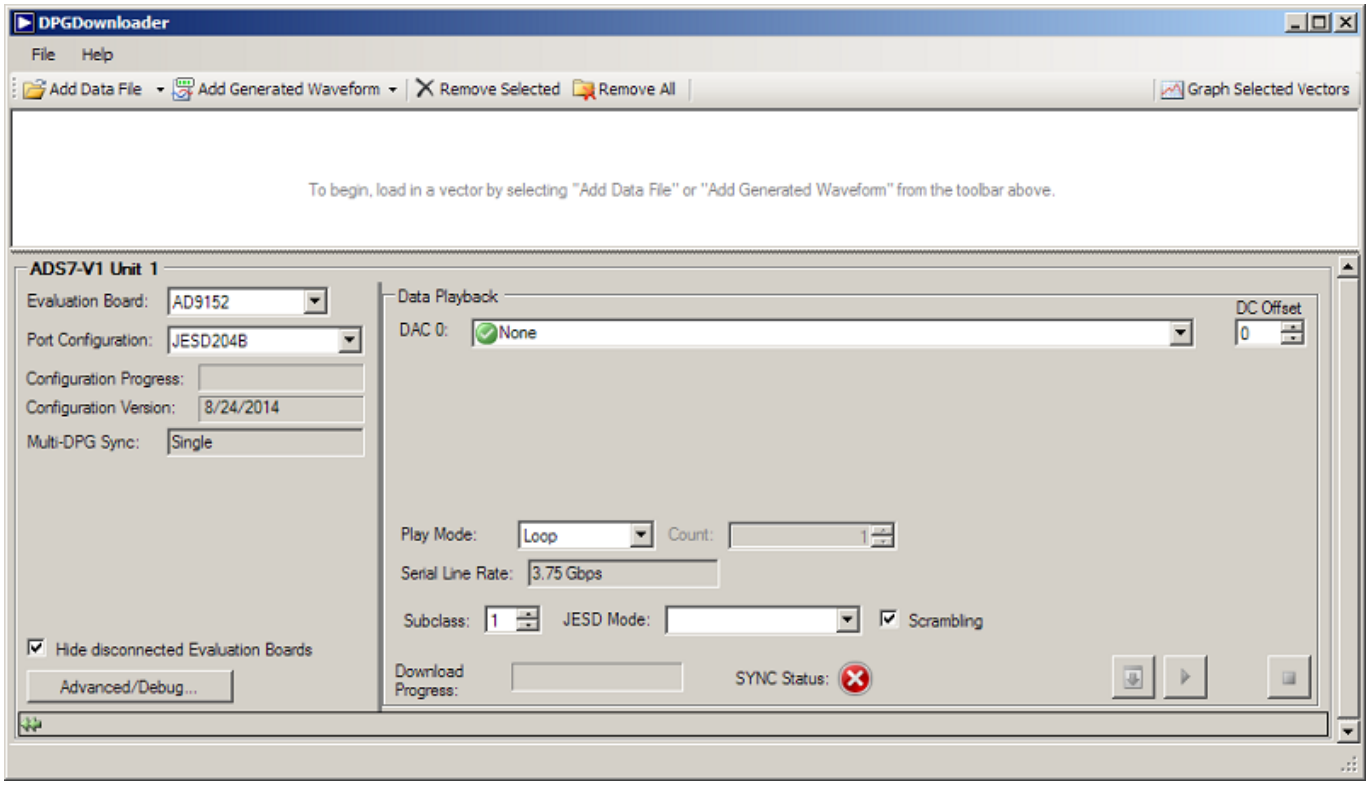

Figure 3. Initial DPG Downloader Panel

2. Open SPIPro. It will show AD9152-FMC-EBZ in the upper left hand corner.

3. Select single link, JESD mode 4, Interpolation 4. Press ‘Configure DAC and Clock’ button. JESD204B PLL lock will turn green.

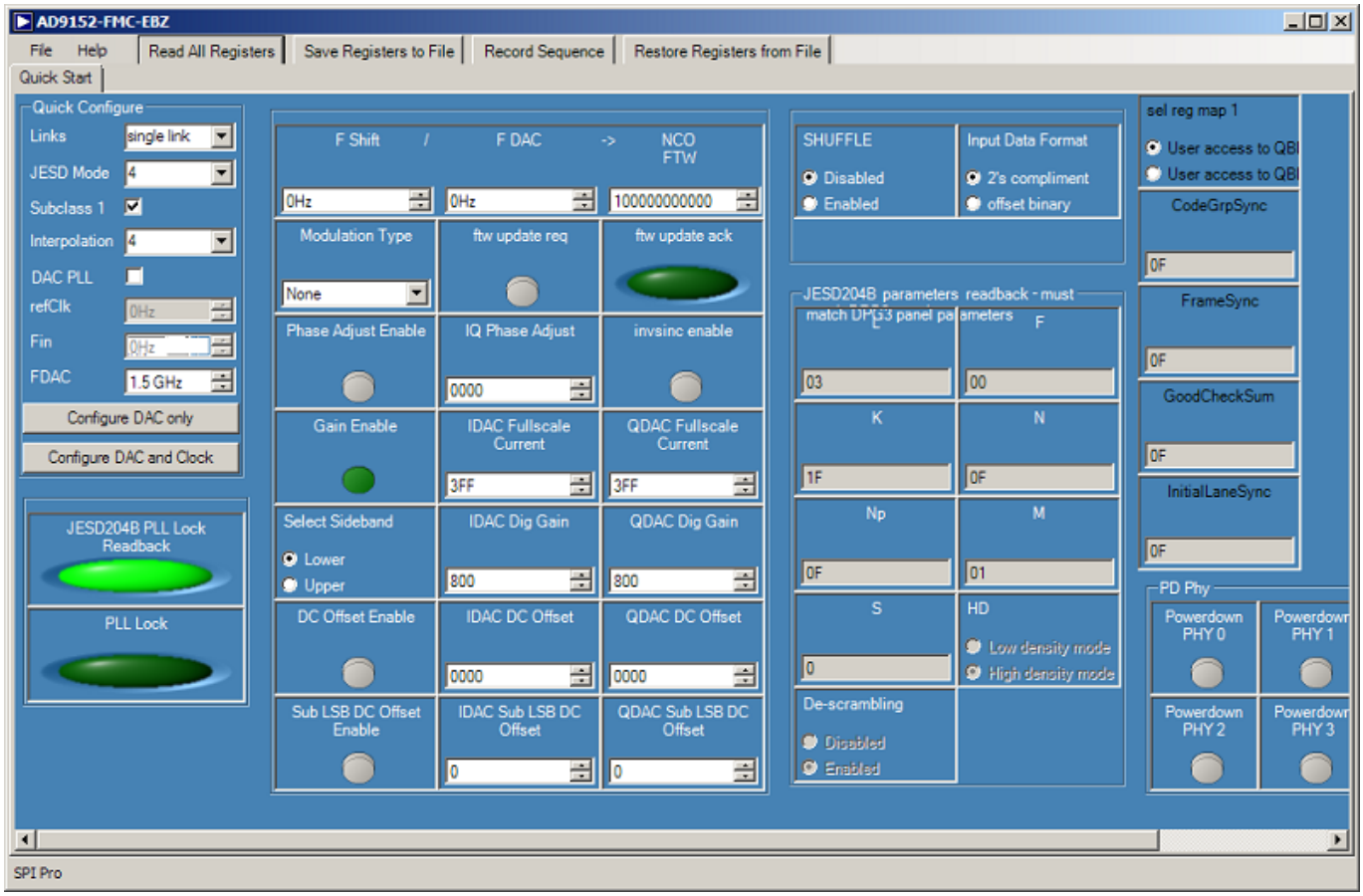

Figure 4. Fully Configured SPIPro Display

4. Select Single Tone under the Add Generated Waveforms Tab. Set Data Rate: 375Mhz, Desired Frequency: 100Mhz, Amplitude: -10dbFS, Uncheck Unsigned Data, Check Generate Complex Data (I and Q)

5. Click Download () and Play () in the DPG Downloader screen. The spectrum in figure 6 will appear on all 2 DAC outputs (J17, J4,), Serial Line Rate will be 3.75Gsps.

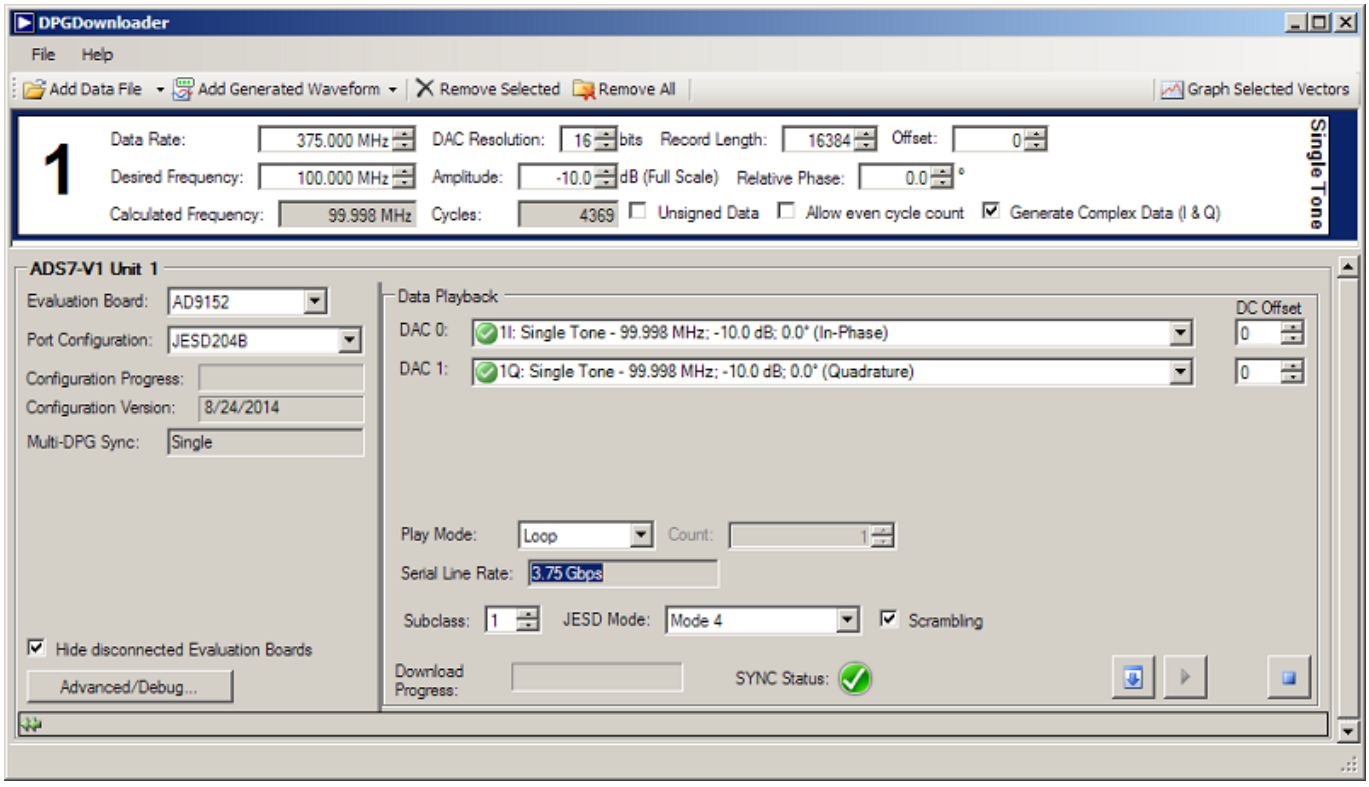

Figure 5. AD9144-FMC-EBZ Fully Configured DPG Downloader Display

6. Here is what you will see at the output of DAC0 on the Spectrum Analyzer.

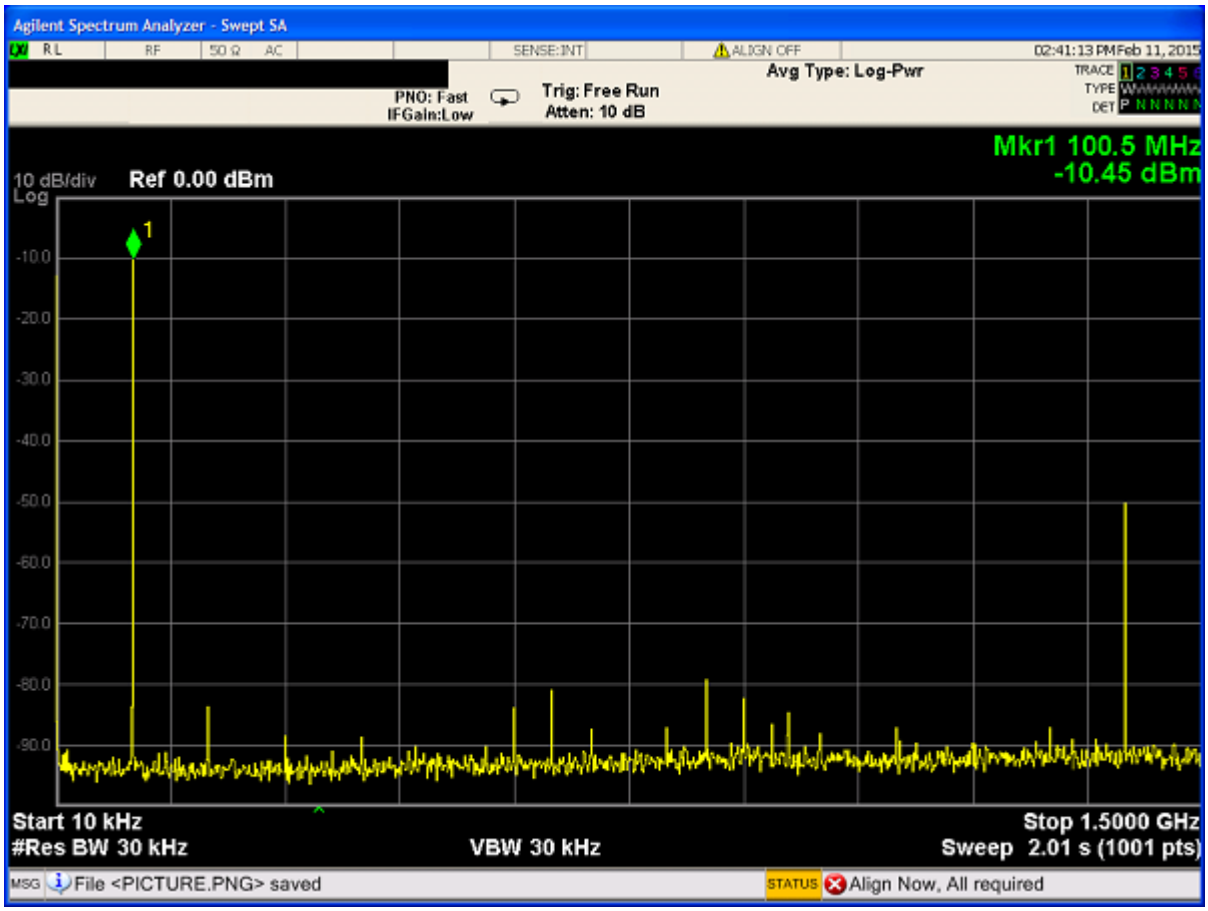

Figure 6. DAC Output Spectrum Analyzer Display