

Quick start ADC1x40D DB

Demonstration board for ADC1440D

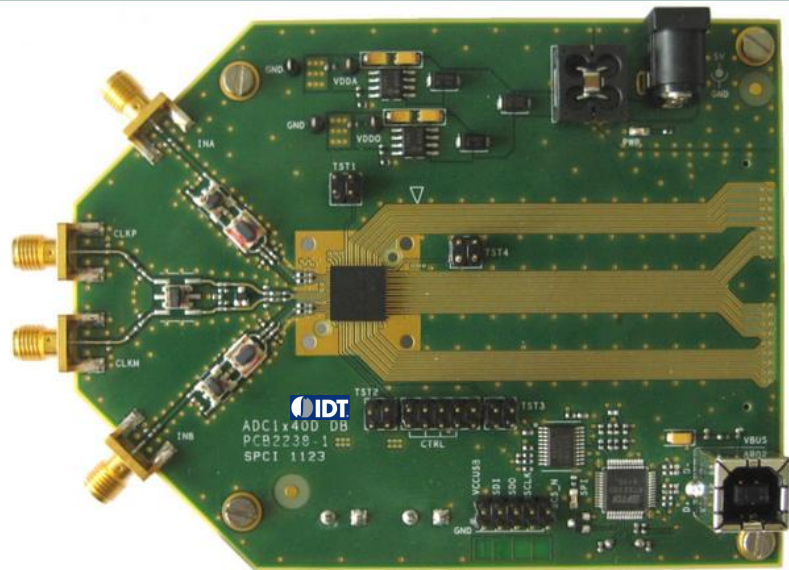
Rev. 02 — 2 July 2012

Quick start

Document information

Info	Content
Keywords	PCB2238-1, ADC1x40D DB, ADC1440D, Demonstration board, ADC, Converter
Abstract	This document describes how to use the demonstration board ADC1x40D DB for the analog-to-digital converter ADC1440D

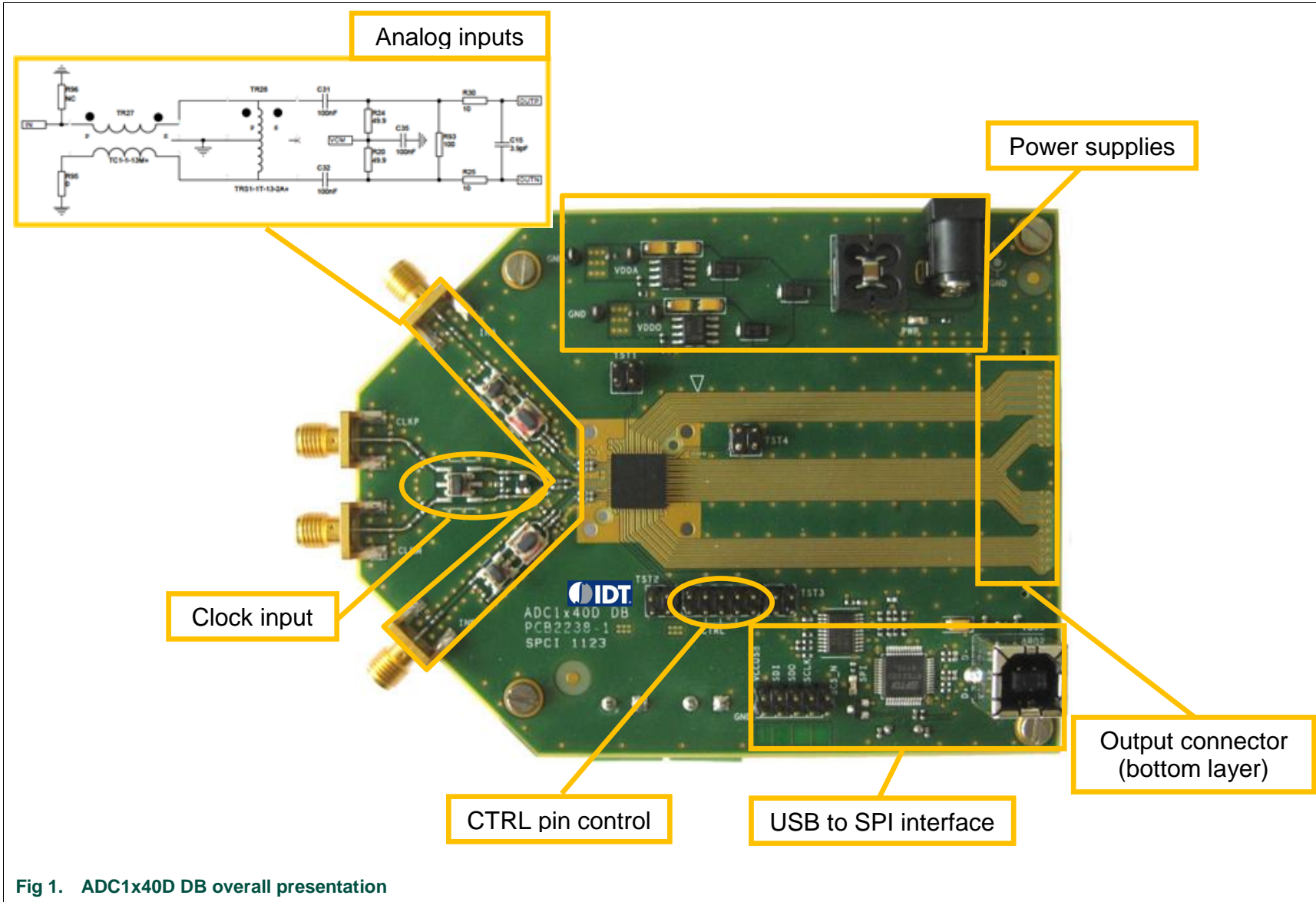
Overview



Revision history

Rev	Date	Description
1	September 2011	Initial version.
2	July 2012	Rebranded.

1. Overview of the demo board ADC1x40D DB



2. Overview of the demo board ADC1x40D DB + HSDC extension module

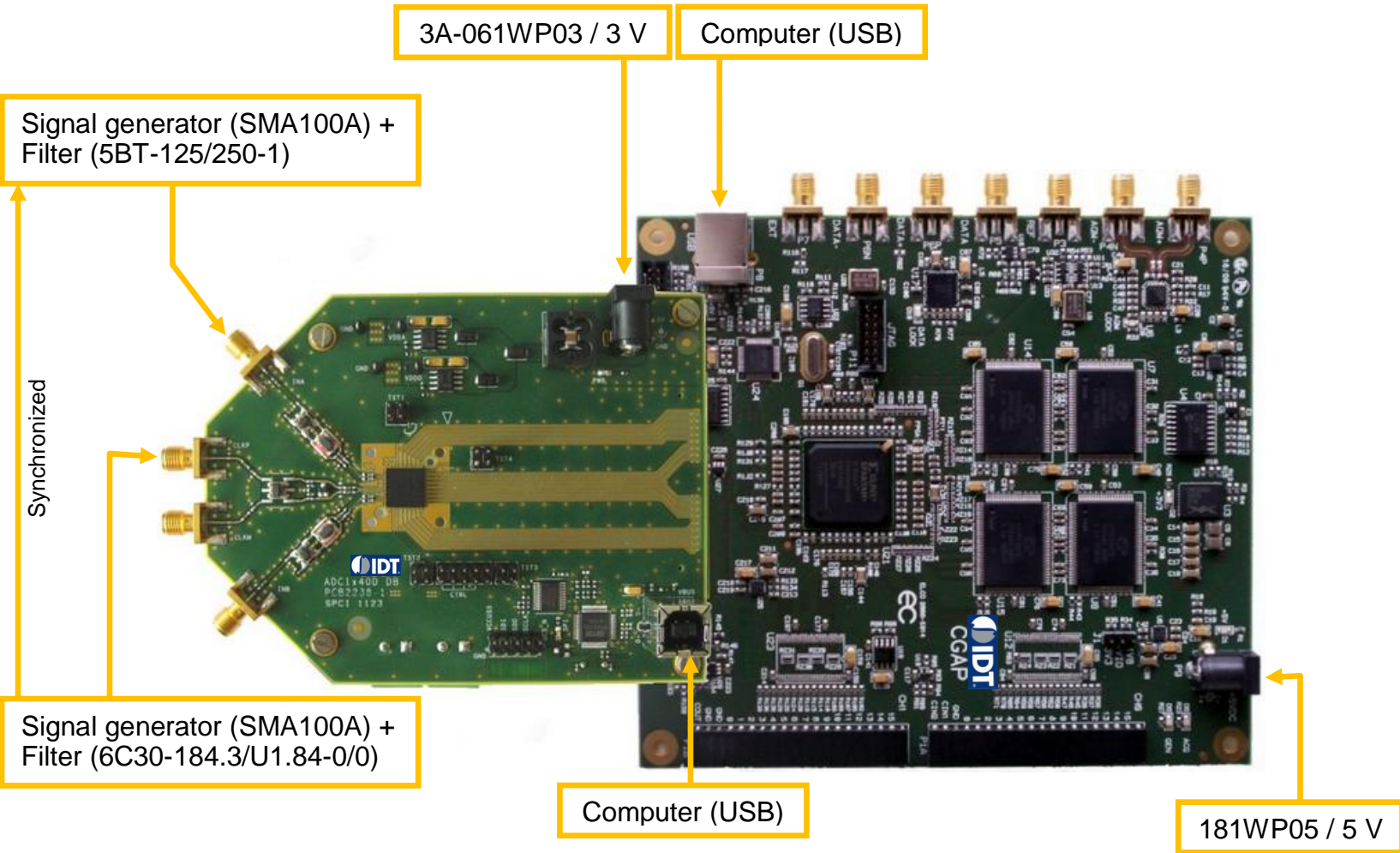


Fig 2. ADC1x40D DB + HSDC extension module overall presentation

3. ADC acquisition tool

3.1 Software start-up

To install the software, please refer to appendix A ‘Software and drivers install’.

Run the application “HSDC_SW_ADC_4.exe”. This application will allow:

- the user to control features through the SPI;
- as well as performing any online data acquisition to evaluate the performances.

3.2 Start-up screen

The screenshot shows the 'IDT HSDC ADC acquisition software' interface. It features a menu bar with 'SPI control - Functional Registers - ADC1440D', 'SPI control - Read / Write Registers', 'Tools', 'Acquisition', 'GPIO & Test config', and 'Info'. The main window is divided into several sections:

- Left Panel:** Contains configuration options for 'NXP device: ADC1440D', 'Resolution: 14', 'Fin and Fs are: Coherent', 'Sampling rate Fs', 'ADC Fs', 'ADC Fs jitter', 'Input frequency Fin', 'ADC Fin 1', 'ADC Fin 2', 'ADC Fin jitter', 'Number of samples: 65536', and 'Acq. mode: FOLDED'. There are 'INITIALIZATION', 'SAVE SETTING', and 'RESTORE SETTING' buttons.
- Top Right:** A 'QUIT' button.
- Center:** 'Acquisition' section with 'Fin coherent (MHz): 0.0000000000', 'Select window type: No window', 'Enable FFT averaging: 10 (max. 255 trials)', 'Store to file', 'Line Header', 'Results file', and 'ACQUIRE' button.
- Bottom Center:** A plot area showing 'FFT Spectrum' with 'Magnitude' on the y-axis and 'Frequency (Hz)' on the x-axis. A '5. Click 'INITIALIZATION'' callout points to the 'INITIALIZATION' button.
- Right Panel:** A table with columns 'Item', 'ADC1', 'ADC2', and 'Unit'. It lists various parameters like 'ADC Digitized signal', 'ADC AC parameters', 'ADC Harmonics', and 'ADC Code excursion'.

Numbered callouts provide instructions:

1. Select the wanted IDT product
2. Select 'Coherent' for optimized FFT processing. Otherwise select 'Not coherent'
3. 'GREEN' when USB is ready
4. 'GREEN' when USB and clock (DAV) are ready
5. Click 'INITIALIZATION'
6. Select the number of points for FFT
7. Enter the sampling frequency
8. Enter the input frequency. The coherent frequency will be automatically calculated

A warning icon (exclamation mark in a triangle) is located at the bottom left, with the text: 'Depending on the version, it could be needed to first program the IC'.

Fig 3. Start-up screen

3.3 Read / Write Registers

The screenshot shows the IDT HSDC ADC acquisition software interface. On the left, there are various configuration parameters such as Sampling rate Fs, ADC Fs, DC Fs jitter, and Output frequency Fin. In the center, there are buttons for 'READ ALL REGISTERS', 'SAVE REGISTERS TO FILE', 'LOAD REGISTERS FROM FILE', and 'DUMP REGISTERS'. On the right, there is a table of registers with columns for Register name, Address, and Value (A and B).

1. 'READ ALL REGISTERS' will allow to get an overview of the main analog registers

2. If available, load the settings file

Register name	Address	Value	
		A	B
CHIP_ID	x1	x40	x40
OP_MODE	x6	x0	x0
CLK_CFG	x7	x0	x0
INTERNAL_REF	x8	x0	x0
CHANNEL_SEL	x9	xF	xF
OUTPUT_CFG	x11	x0	x0
DAV_CFG	x12	x16	x16
DIG_OFFSET	x13	x0	x0
TEST_CFG_1	x14	x0	x0
TEST_CFG_2	x15	x0	x0
TEST_CFG_3	x16	x0	x0
RESERVED_2	x17	x14	x14
LVDS_CFG	x21	x8	x8
CTRL_CFG	x23	x7	x7
NS_CFG_1	x30	x2	x2

3.4 Functional Registers

1. Select the channels to be modified

2. 'Write all registers' allow to send all the values at the same time

3. Write the value in the register

4. Modify the value

Fig 5. Functional Registers

3.5 Acquisition

1. If needed, the performances can be calculated over a reduced bandwidth

2. Click acquire to process data acquisition and FFT processing

3. Select 'Continuous acquisition' for real-time processing

4. Select the channel to display

5. If 'Not coherent', select a window for processing

6. Performances are available in the table

Item	ADC1	ADC2	Unit
ADC Digitized signal			
Frequency	16.400		MHz
Amplitude	-3.506		dBFS
ADC AC parameters			
SNR	68.58		dBc
SNR	72.09		dBFS
SINAD	68.51		dBc
ENOB	11.09		bits
SFDR	85.42		dBc
SFDR	88.93		dBFS
THD	-86.43		dBc
NSD	-150.94		dBFS/Hz
ADC Harmonics			
H2	-86.828		dBc
H3	-97.812		dBc
H4	-113.626		dBc
H5	-105.800		dBc
H6	-122.298		dBc
ADC Code excursion			
Min	2721		codes
Max	13670		codes
Mean	8195.33		codes

Fig 6. Acquisition