

Quick start ADC1453D, ADC1159D evaluation board

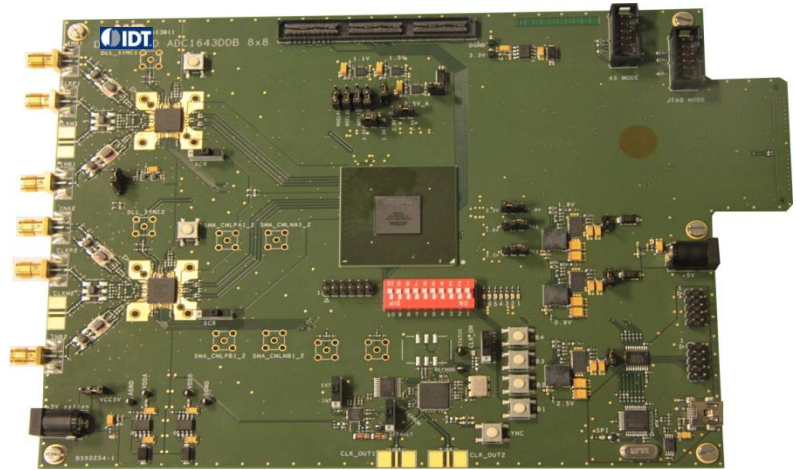
Rev. 01 — 14 Nov 2013

Quick start

Document information

| Info | Content |
|-----------------|---|
| Keywords | ADC1453D, ADC1159D, ADC1453DxxxW1-DB, evaluation board, ADC, Converter, JESD204B, BSX0254. |
| Abstract | This document describes how to use the evaluation board for the dual channel analog-to-digital converters ADC1453D and ADC1159D with JESD204B output interface. |

Overview



Revision history

| Rev | Date | Description |
|-----|------------------|-----------------|
| 1 | 14 November 2013 | Initial version |

1. Overview of the evaluation board:

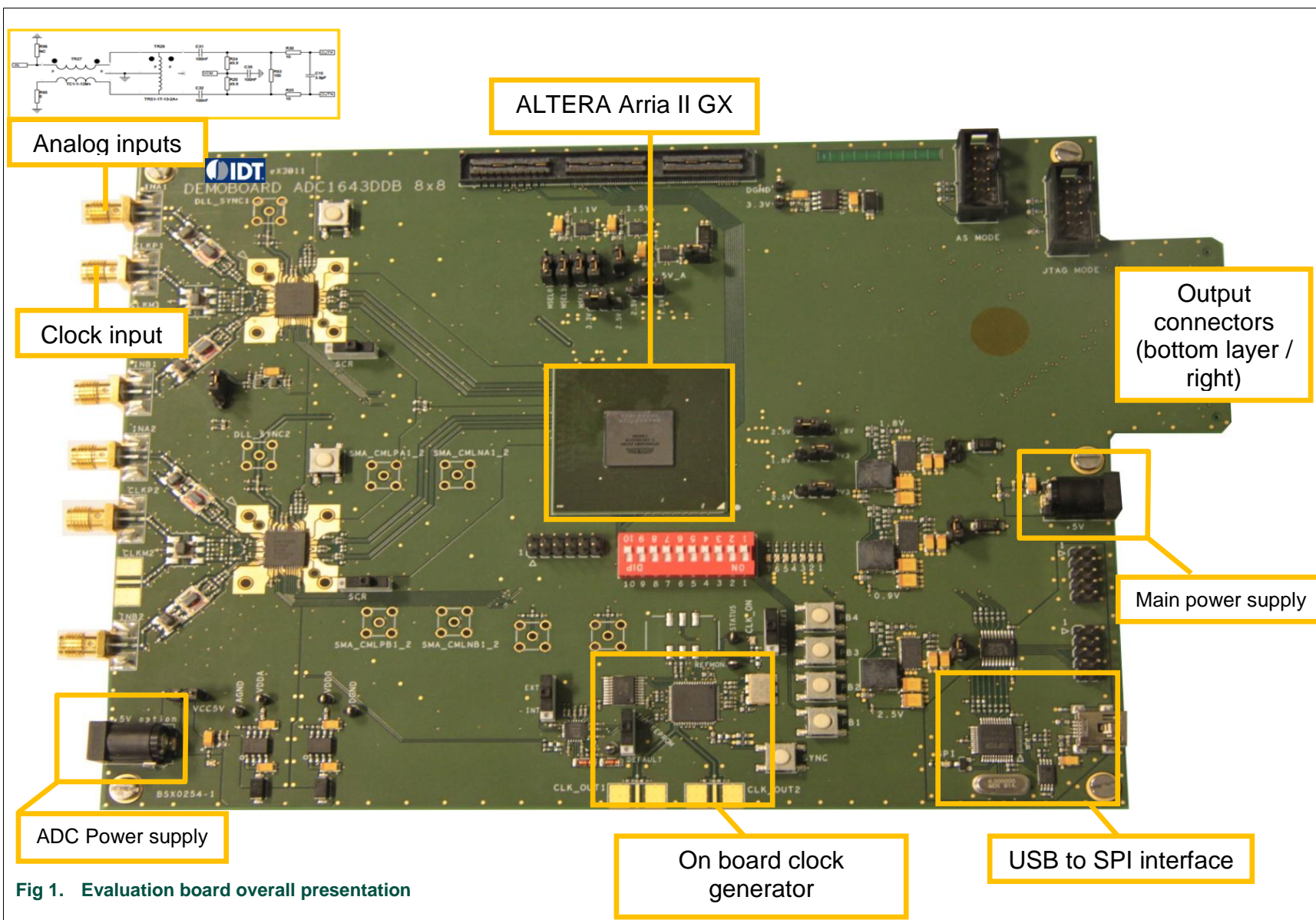


Fig 1. Evaluation board overall presentation

2. Switch and Jumpers default state

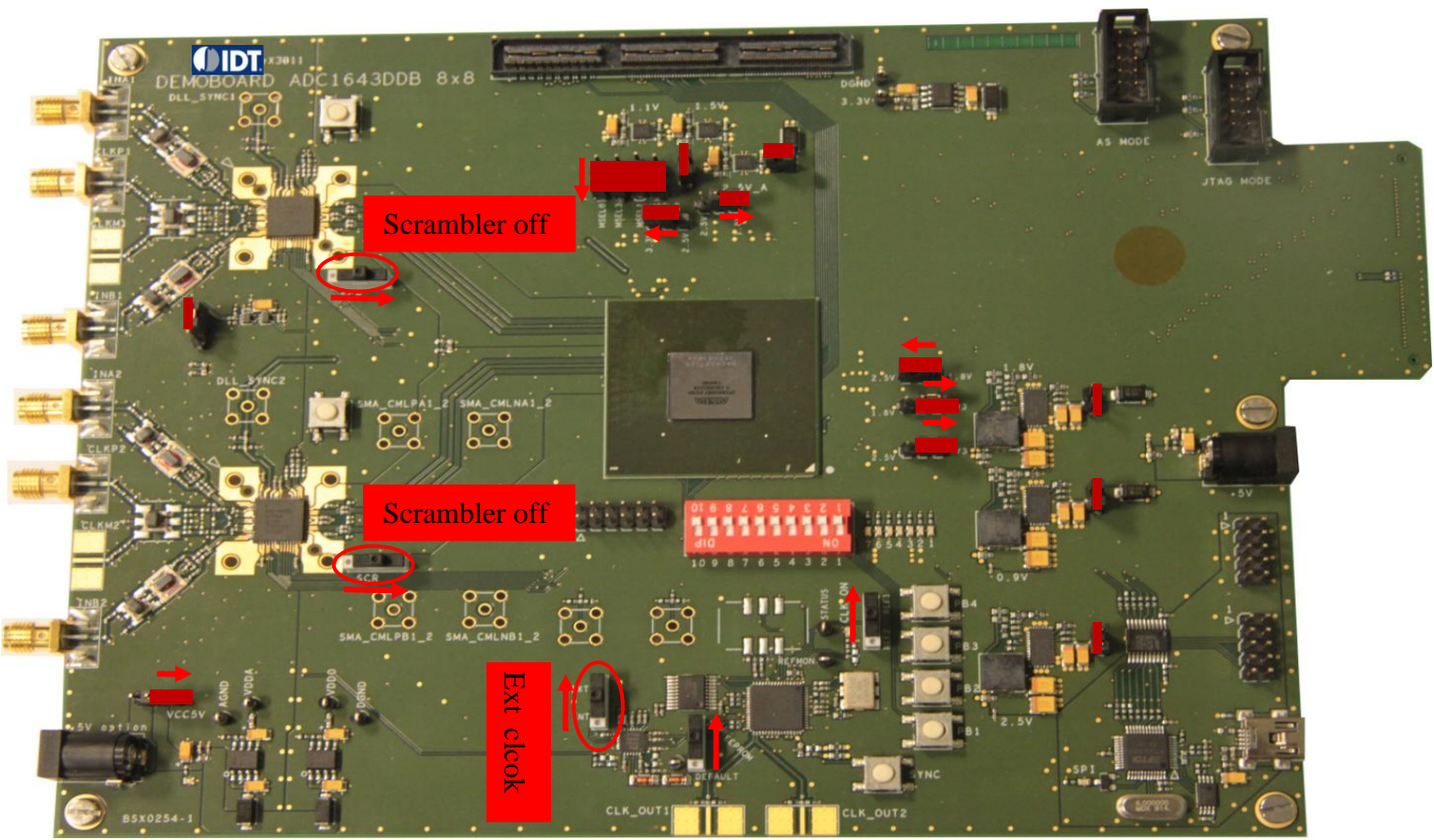


Fig 2. Overall presentation of default switches and jumpers

3. Typical test configuration:

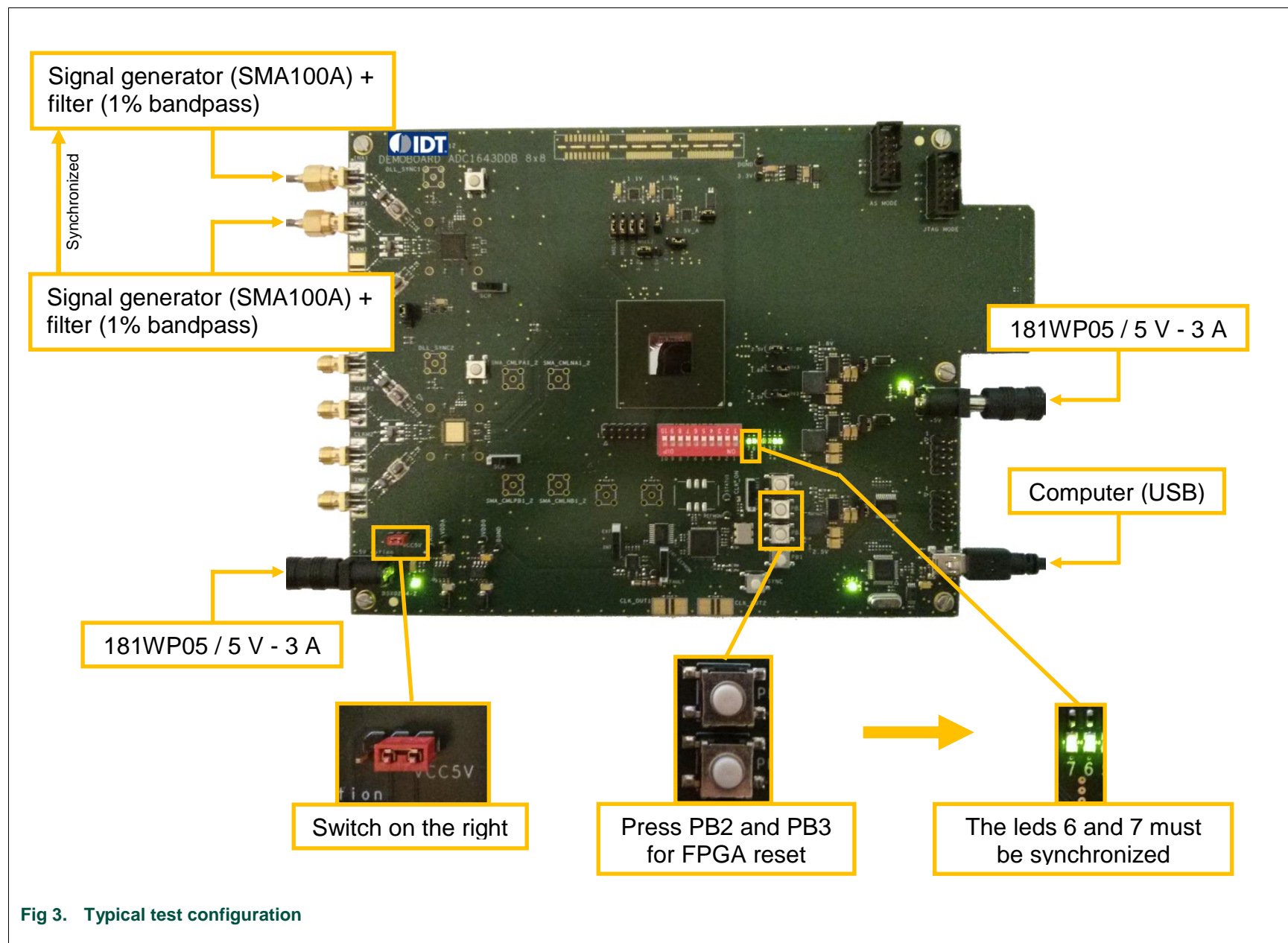


Fig 3. Typical test configuration

4. ADC acquisition tool

4.1 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.

4.2 Start-up screen

The screenshot shows the 'IDT HSDC ADC acquisition software' interface. The main window is titled 'HSDC_SW_ADC_4.vi' and contains several panels. On the left, there are configuration fields for 'NXP device' (ADC1443D), 'Resolution' (14), 'Sampling rate Fs' (153,600,000), and 'Input frequency Fin'. The 'Acquisition' panel in the center has 'Fin coherent (MHz)' set to 0.0000000000 and 'Store to file' checked. The 'FFT Spectrum' plot shows a magnitude vs. frequency graph. On the right, there is a table of ADC parameters and harmonics. A 'QUIT' button is visible in the top right corner.

Numbered callouts provide the following instructions:

1. Select the ADC1443D product
2. Select 'Coherent' for optimized FFT processing. Otherwise select 'Not coherent'
3. Enter the sampling frequency
4. Select the number of points for FFT
5. Enter the input frequency. The coherent frequency will be automatically
6. Click 'INITIALIZATION'
7. 'GREEN' when USB is ready
8. 'GREEN' when Acquisition is ready

An additional callout in the top right corner states: "To quit the interface, please click 'quit'" pointing to the 'QUIT' button.

Fig 4. Start-up screen

4.3 Read / Write Registers

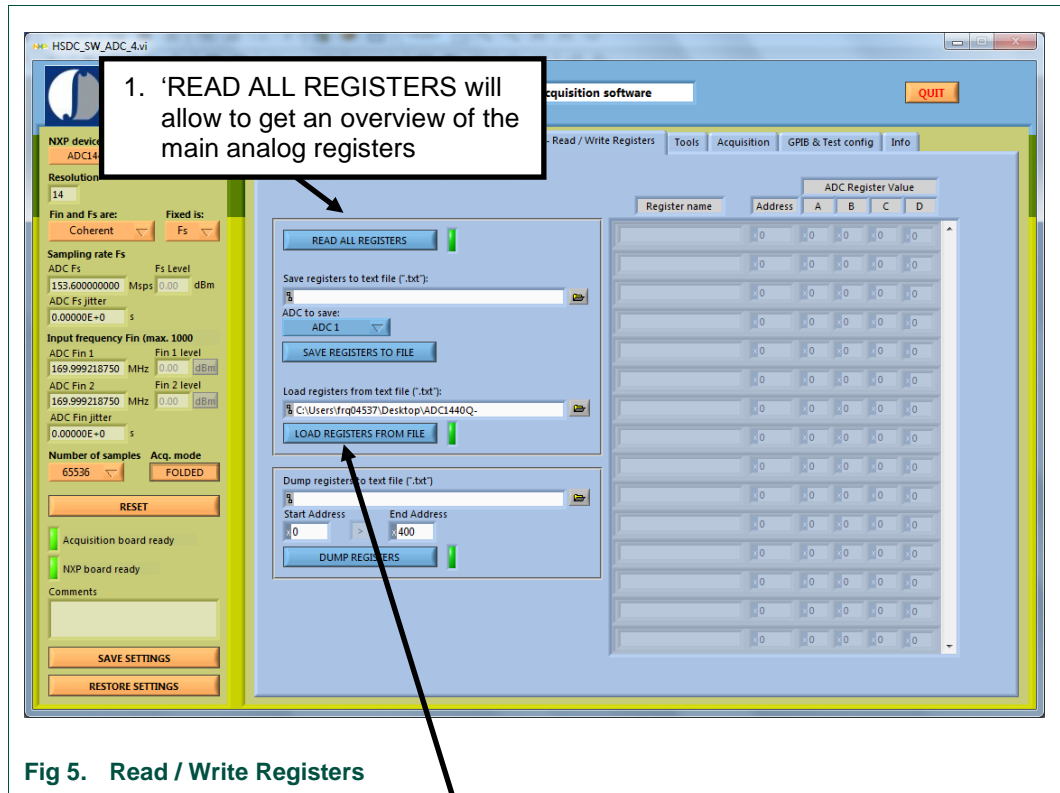


Fig 5. Read / Write Registers

2. Load the SPI registers settings file.
Please contact your IDT Sales/FAE representatives to get access to SPI settings files for ADC1443D or ADC1453D or ADC1159D250 devices. 3 SPI registers settings files are available:
 - ADC1453D160_SPI.txt
 - ADC1453D250_SPI.txt
 - ADC1159D250_SPI.txt

4.4 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 6. Functional Registers

4.5 Acquisition

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

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

1. Select the channel to display

5. Click acquire to process data acquisition and FFT processing

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

6. Performances are available in the table

| Item | ADC1 | ADC2 | Unit |
|-----------------------------|------|------|---------|
| ADC Digitized signal | | | |
| Frequency | | | MHz |
| Amplitude | | | dBFS |
| ADC AC parameters | | | |
| SNR | | | dBc |
| SINR | | | dBFS |
| SINAD | | | dBc |
| ENOB | | | bits |
| SFDR | | | dBc |
| SFDR | | | dBFS |
| THD | | | dBc |
| NSD | | | dBFS/Hz |
| ADC Harmonics | | | |
| H2 | | | dBc |
| H3 | | | dBc |
| H4 | | | dBc |
| H5 | | | dBc |
| H6 | | | dBc |
| ADC Code excursion | | | |
| Min | | | codes |
| Max | | | codes |
| Mean | | | codes |


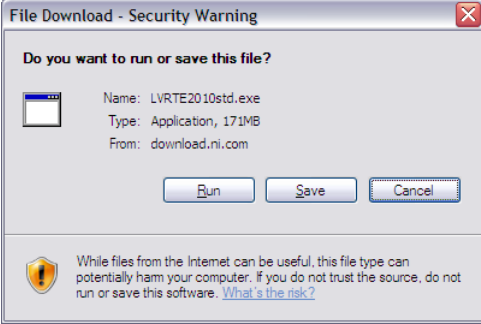


Fig 7. Acquisition



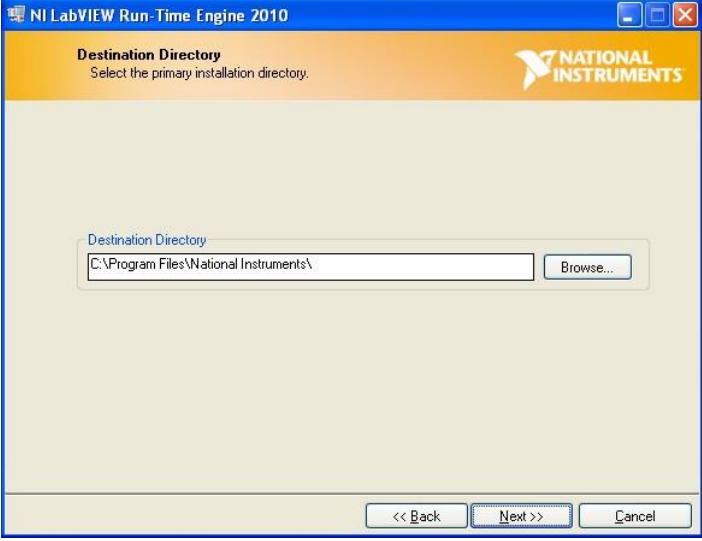


In case of bad acquisition or when changing the sampling frequency, take care to reset the FPGA by pushing on-board button PB3.



5. Software and drivers install

5.1 Labview Runtime 2010 install

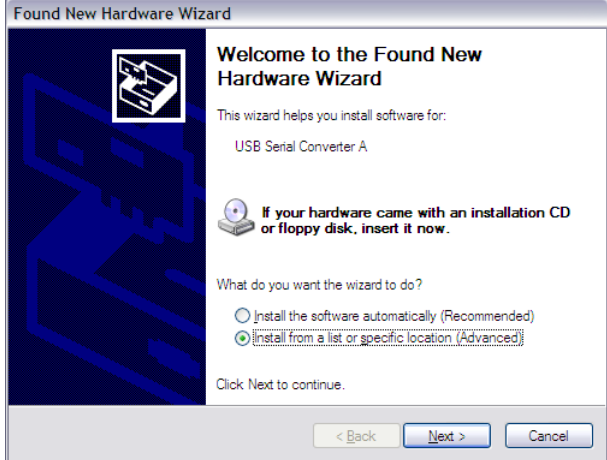
| | | |
|---|---|--|
| 1 | Go to National Instruments web page http://joule.ni.com/nidu/cds/view/p/id/2087/lang/en | |
| 2 | Download 'LVRTE2010std.exe' |  |
| 3 | Save |  |
| 4 | Run the application 'LVRTE2010std.exe' | |
| 5 | OK |  |
| 6 | Unzip |  |

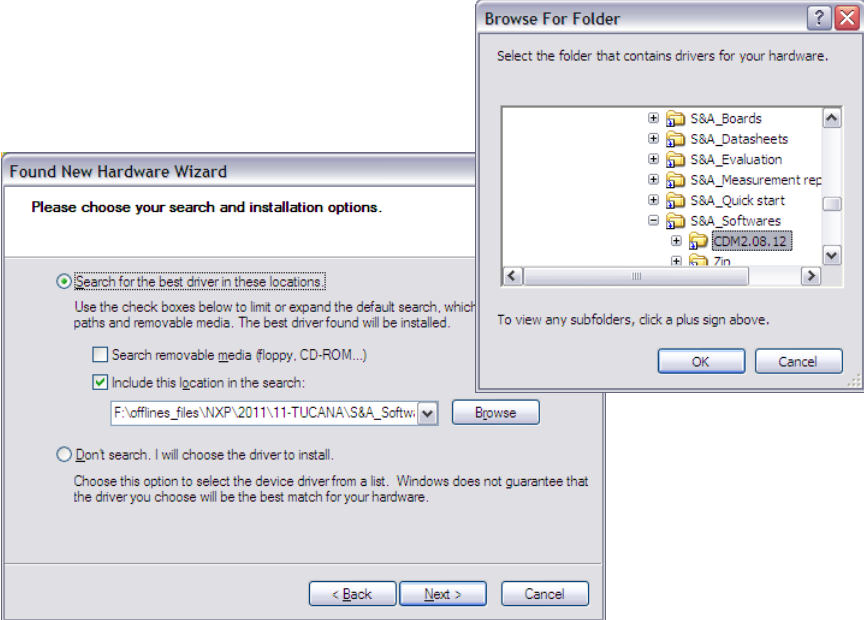

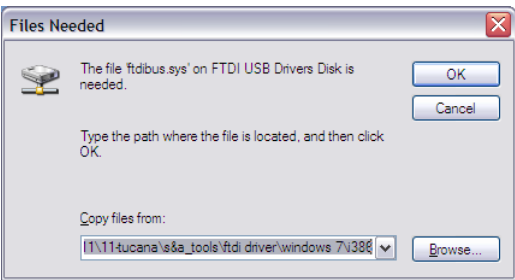
| | | |
|---|------|---|
| 7 | OK |  <p>WinZip Self-Extractor</p> <p>240 file(s) unzipped successfully</p> <p>OK</p> |
| 8 | Next |  <p>NI LabVIEW Run-Time Engine 2010</p> <p>ni.com/labview</p> <p>NATIONAL INSTRUMENTS LabVIEW™ 2010</p> <p>Exit all programs before running this Setup. Disabling virus scanning utilities may improve installation speed. This program is subject to the accompanying License Agreement(s).</p> <p>National Instruments Corporation is an authorized distributor of Microsoft Silverlight.</p> <p>© 2010 National Instruments. All rights reserved.</p> <p>NATIONAL INSTRUMENTS</p> <p><< Back Next >> Cancel</p> |
| 9 | Next |  <p>NI LabVIEW Run-Time Engine 2010</p> <p>Destination Directory Select the primary installation directory.</p> <p>NATIONAL INSTRUMENTS</p> <p>Destination Directory</p> <p>C:\Program Files\National Instruments\ Browse...</p> <p><< Back Next >> Cancel</p> |

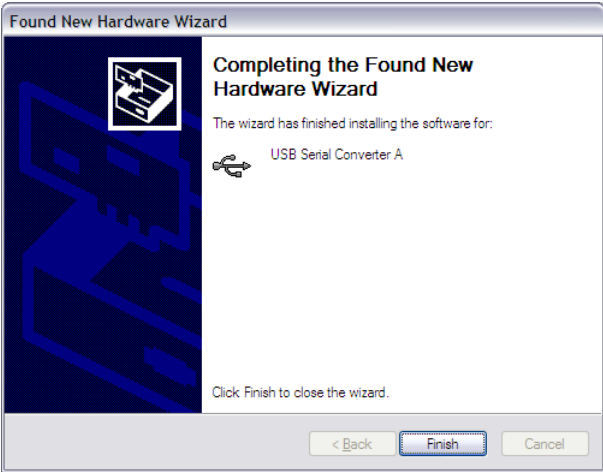
| | | |
|-----------|--|--|
| <p>10</p> | <p>Next</p> | |
| <p>11</p> | <p>Select 'I accept the License Agreement'</p> <p>Next</p> | |
| <p>12</p> | <p>Next</p> | |

| | | |
|----|---------|---|
| 13 | Finish |  |
| 14 | Restart |  |

5.2 Demoboard - USB-SPI driver install

| | | |
|---|---|--|
| 1 | Plug the USB cable in the demoboard USB connector | |
| 2 | The wizard will help to install the USB Serial Converter A | |
| 3 | <p>Select 'Install from a list or specific location'</p> <p>Next</p> |  |

| | | |
|----------|--|--|
| <p>4</p> | <p>Select 'Search for the best driver in these locations'</p> <p>Select 'Include this location in the search'</p> <p>Browse</p> <p>Select the folder 'CDM2.08.12'</p> <p>Next</p> |  |
| <p>5</p> | <p>Continue Anyway (Windows XP only)</p> |  |
| <p>6</p> | <p>Browse</p> <p>Select the file 'ftdibus.sys' in the folder 'CDM2.08.12\i386'</p> <p>OK</p> |  |

| | | |
|---|---|--|
| 7 | Finish |  |
| 8 | The wizard will help to install the USB Serial Converter B (same as USB Serial Converter A) | |
| 9 | The wizard will help to install the USB serial port The file 'ftser2k.sys' is in the folder 'CDM2.08.12i386' | |

