

Radar Project - How to Get ADC Data from Radar

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This is a short tutorial about getting raw ADC data from radar + DCA1000 EVM for the groups who work on radar-related projects.

1 Radar and DCA1000EVM

The devices we are using are TI IWR6843ISK radar link and DCA1000 Evaluation Board link. The radar captures data and has some signal processing modules on board. However, the capacity and transmission link on the radar board are limited, so in most cases radar board can only output processed data. To have more flexibility and get hands-on with radar processing algorithms, we will use mm-wave Studio GUI link and DCA.

2 Data Capture

Here are some hints/material that help you set it up. This is not as detailed as the lab handout, which is the meaning of a project! But we do not mean to block you at this step, feel free to ask TAs questions.

1. Make sure the firewall on computers is disabled. You may need a TA for admin access.
2. Go look at the training from TI about DCA (uploaded in Canvas ‘project/radar/’ folder). The software requirements should all be installed on the lab computers. If you plan to use your own Windows laptop, install all the requirements on page 4.
3. Look at Page 9 ‘Hardware Setup (4) – xwr6843EVM RevD + DCA1000’. Set the hardware **exactly** as in the slide and picture.
(Note: make sure the switches on boards also match.)
4. You can use the 3D printed holder to fix the radar and DCA on a tripod. Connect the radar microUSB, DCA microUSB, and DCA ethernet cable to the adaptor that you have. Connect the power cable of DCA. Then connect the adaptor to the computer.
5. Look at Page 11 of the DCA document and follow the steps to Page 20.
Note: For the step on Page 20, you should see the FPGA version as [record 2.8] or [record 2.9]
6. Then follow the step on Page 21, you can capture data through DCA!

Then, You can try different configurations in the mmwave Studio to get your desired resolutions. A few helpful notes:

- I recommend you to calculate parameters, such as resolutions and maximum range, to see if your calculations match with the ones in Post processed 'Calculated Parameters'. This helps you understand better mmwave studio and radar.
- I will recommend starting with the controlled settings first to see if your result makes sense.
- From a system design perspective, what are the resolutions and system parameters you want? Based on these, what are the chirp configurations you want?

3 Read Data

1. You can save data and save the config in Figure 1
2. There are two Matlab files that help you read the binary data and configuration files in the same Canvas folder.

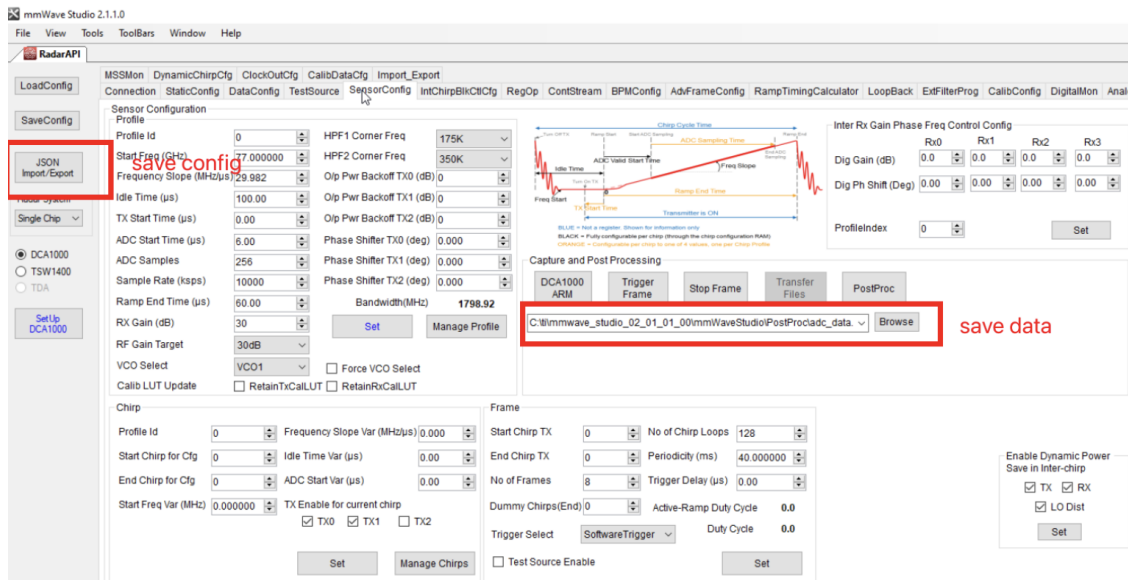


Figure 1: Saving data and configurations from DCA

Hope you can get radar cube data in Matlab at this point! Feel free to ask questions during this process!