Required Materials: Analog Discovery (with fly wire connectors), Jumpers, ADC Chip, Test Board, Computer (Waveforms and Python installed).

Procedure:

Board Setup

The board was designed to have more than one configuration to help facilitate testing different characteristics of the ADC. Table V shows which jumpers to connect in order to recreate the board environment of the tests in *IV.B Transfer Characteristics*.

Table V Board Jumper Configuration For Test Environment Recreation

Board Reference Designator	Silkscreen Label
J10	AVSS~PAD
J10	AVSS~CHIP_AVSS
J10	GND~IOVSS
J10	GND~VSS
J10	GND~PAD
J10	GND~AVSS
J12	DFF~IOVDD

J12	NOR~IOVDD
J5	CHIP~IOVDD
J5	CHIP~IOVDD
J5	CHIP~VDD
J11	VDD~BUFF
J9	*Place jumper on every team that you are not currently testing*

Connecting Analog Discovery

Table VI shows which fly wires to connect from the Analog Discovery to the board.

Table VI Analog Discovery Flywire Connections For Test Environment Recreation

Flywire Number	Board Reference Designator	Board Header Silkscreen Label
W1	J2	*Connect this to the team you want to test*
V+	J1	VSUP
GND	J1	GND

DIO 14	J3	RES
DIO 15	J3	*Connect to the same team number as W1*
DIO 13	J4	*Connect to the same team number as W1*

Script Setup

Plug in the Analog Discovery into your computer and ensure you have Waveforms and Python installed. You should have two windows open:

1. Waveforms (ADC_test_scripts workspace), and

2. Terminal in the ADC_test_scripts directory.

You'll need to install the python dependencies which are in the requirements.txt file.

Run command *pip install -r requirements.txt* from the terminal window to quickly install them all.

Running Tests (Linear Sweep Example)

Below is an example of the workflow for using the linear sweep script. Using the scripts for the other tests follow the exact same workflow, so only the linear sweep example will be shown here.

1. After all the Analog Discovery pins are connected go to the Waveforms workspace and click the supplies tab.

2. Click Master Enable is Off, wish should turn the X into a green check mark, turning the supplies on.

3. At the top click the scripts tab. You should see three files: linear_sweep_test, high_low_test, multiple_measurements_single_value (these names also correspond to the python script file names in the ADC_test_scripts directory).

4. Click the linear_sweep_test file.

5. Scroll down to the variables chipNumber and teamNumber. Ensure they have the same values as the team and chip you're currently testing.

6. Find the filePath variable and change it so that it matches the location of the ADC_test_scripts directory on your computer.

7. Look at the top of the file and click the green play button next to the linear_sweep_test file name. This will run that script. You should see the logging at the bottom "Starting test, Vin = …". When complete the data should appear in "ADC_test_scripts/chip_#/team_#"

8. Open the linear_sweep_test.py file in your code editor of choice. Scroll down to the variables chipNumber and teamNumber and change them to the same numbers you ran the test for in the workspace.

9. Run the command *python linear_sweep_test.py*. You should see the logging start. This will process the raw data, save the voltage readings into several results files, then plot the results and save the plots in png figures.

10. Open the figure to verify the test worked properly. "chip_#/team_#/results_DC_chip-#_team-#_N-1024.png"

Archiving Results

When you want to switch tests and are done with the data, move all the chip_# directories that were generated into a separate folder (ex. archived_test_data folder), and rename the folder to something else that describes what test was done. This scheme was done to avoid advanced saving and organizational techniques were not necessary to implement when developing the scripts.