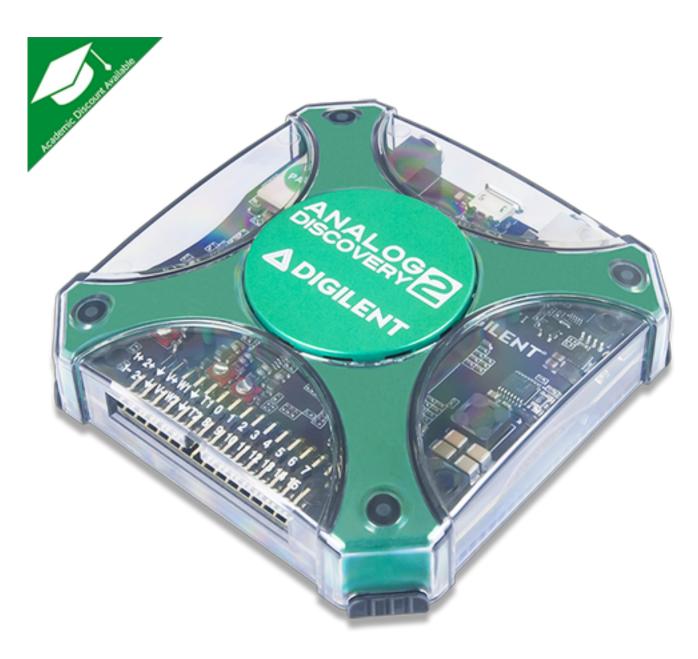
Applied Statistics 2018

Project Preparation — Ball on an incline —

Software installation

- For the project you will be using **Analog Discovery 2** instrument
 - Easily connected to your laptop via standard USB cable (not USB-C)
- Communication between the instrument and your laptop is provided via dedicated WaveForms software
 - You **need to have it installed** in your laptop **BEFORE** the lab starts
 - Available for Windows, Mac OS & Linux (dep, rpm)
 - Download it here : https://reference.digilentinc.com/reference/software/waveforms/waveforms-3/start
 - Easy and straightforward installation (you do not need any special drivers/additional tools)
- Experiment setup of the incline will be prepared for you connected to the instrument
 - No need to worry about this part

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Step-by-step preparation

(illustrated on MacOS)



- Launch WaveForms. It should complain that it does not detect any device. Click No
- In the lab, you will plug USB cable first

000		😽 WaveForms (new worksp	ace)
		Welcome 🐈	Help	
Scope	Open Workspace			To create custom application see the <u>SDK</u> . For more information visit <u>www.digilentinc.com/waveforms</u> . Observations are welcome on <u>this forum page</u> or <u>via email</u> .
Wavegen	Recent:			8
⊣⊨ Supplies	incline_test /Users/vpacik	/Desktop/incline_test.	<u>dwf3work</u>	
Logger				
Logic		No device detecte Digilent FTDI Drive	er is not inst	
Patterns		Start driver install	(****	No Yes
StaticIO			Gune	
Spectrum				
Network				
Protocol	New Save	🖌 Save As		
{JS} Script	Thew Tave	Save As		DIGILENT
	Open last workspace o	n start		A National Instruments Company
Manual Trigger				Not connected ! Status: NC

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Launch WaveForms





Select Discovery2 DEMO and click Select

		•• ••	aveForms (new wo				
			😽 Device Manag	ger			3
Scope	Calibrate	Rename 🔞 My	device is not listed			ie <u>SDK</u> . lentinc.com/wave orum page or <u>via</u>	
	Name)	Serial Number Status				
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Supplies	Discovery	DE	MO				
	EExplorer	DE	МО				
V- Voltmeter	DDiscovery	DE	МО				
	Sound Card						
√ Logger			•				
10	Scope	Wavegen		Patterns	Others		
h7 Logic	1 2 x 8 k	4 x 4 k	16 x 4 k	16 x 1 k	DEMO Discov		
Patterns							
Patterns Patterns StaticIO							
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StaticIO Spectrum Network	New 📄		ave As	Ca	ncel Select Select DIGILEN		

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Select (DEMO) device





Click green plus and select Supplies

		😽 Wa
		Welc
Scope	Open Workspace	
Wavegen	Recent:	
□ ⁺ Supplies	incline_test /Users/vpacik/Desktop/incline_test.dwf	<u>3work</u>
Logger		
Patterns		
StaticIO		
Spectrum		
Network		
Protocol		
{JS} Script	 New Save Save As Open last workspace on start 	
Manual Trigger		

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Add power supplies







- Set Positive Supply (V+) Voltage to 5V
- By clicking on Master Enable is OFF you turn-on power supply for the instrument

File Contra	ol Window		Welcome
			Positive Suppl
			Negative Supp
			USB powered, allowing
Manual Trigger			



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Power supply

₩ WaveForms 2 (new workspace) Help Supplies			6
Master Enable is Off			
ply (V+) Rdy	Voltag :	5 V	
oply (V-) Rdy	Voltage:	-1 V	~
ng up to 500 mW total or 700 mA output per channel.			
	Discovery2 DEMO	Status: OK	6





Now add **Scope** by clicking on green plus again

File Control Window	Welcom
	Positive Su
	Negative Su
	USB powered, allow
Manual Trigger	

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Add scope

	WaveForms 2 (pow Help	(workspace) Stipplies			88
	Scope				
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up	 StaticIO Spectrum Network 		Voltage:	-1 V	~
wir	Impedance Protocol Script	or 700 mA output per channel.			
			Discovery2 DEMO	Status: OK	8



- Oscilloscope display will appear
- Tick-off Channel 2

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Select trigger mode Record



Setup for oscilloscope

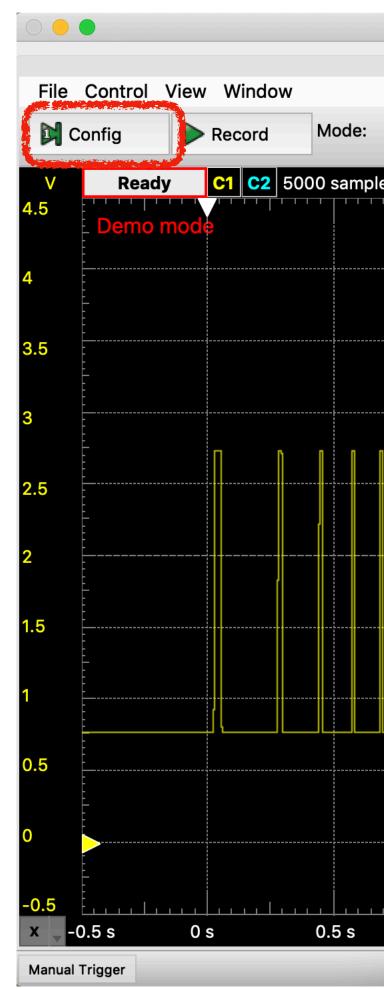


Configure your measurement

- Click on Config and set the the values according to picture
- Do not forget tick-off Noise and tick-on Draw while recording
- Set Level to 2 V

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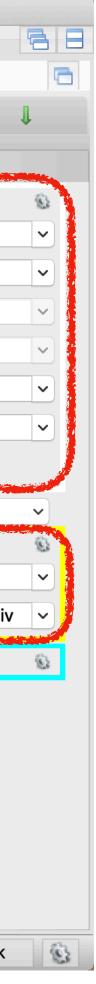
Adjust Time and Channel 1



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picture recording

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	Trigger:	10 %				✓ Time	0.0
						Position:	2 s
	Noise	•				Base:	5 s
	🔽 Draw	while recording				Average:	None
	Not reco	ommended at high sample ra	ite.			Overs.:	Off
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		Cancel Sta	rt 🧧			Rate:	5 kHz
							î
						🕂 🕂 Ada	d Channel
						Channel	A LART AL ANTIC LAS DO
						Offset:	-2 V
						Range:	500 mV/div
						Channel	2
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					Die	scoverv2 DEMO	Status: OK





Now you are ready to measure !

By clicking on Record, you will start measuring (in the lab) which will lasts for 5 seconds (a single run)

 WaveForms 2 (new workspace) Welcome + Help Scope 1 													
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Manual	Trigger										Discovery2 DEMO	Status: OK	3

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11

Save your workspace !!

Wave	Forms	Workspace	Settings	Window	Help		
		🦻 New					W
		늘 Open	жо			Welco	me 🖣
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			0.00				

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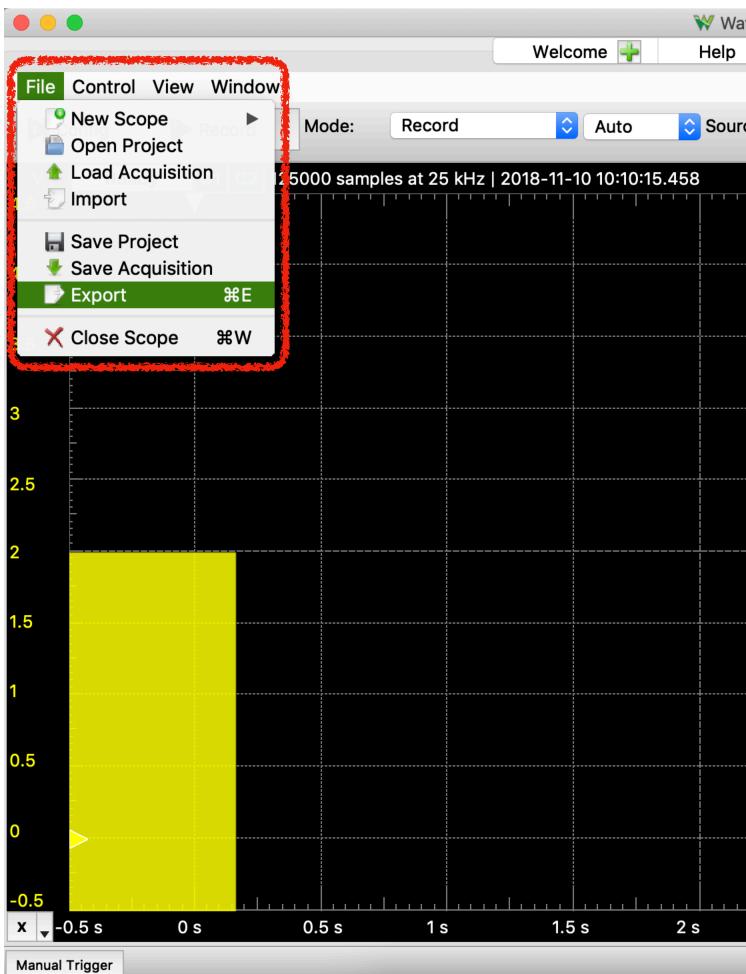
Save your settings by clicking on Workspace->Save As so you can open it during lab and start working

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								D	Discovery	2 DEMO	Statu	us: OK	8



Export your data !!!

After the measurement (in the lab), export your data as CSV file by clicking at File->Export



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							ry2 DEMO	Status: OK	8



Now you are prepared!

Looking forward to seeing you in the lab!