Using the AD2

Last updated 1/29/25

- Hardware Overview
 - USB power source
 - 30 pins (color coded wires)
 - Make sure your circuit always has a ground connection
 - Only need to connect 1 of the ground wires





- Software Overview
 - The Waveforms software will not start without the AD2 plugged in www.workspace

WaveForms (new workspace)	– o x
Norkspace Control Settings Window Help	
Welcome 🐨 🔮 Help	To create custom application see the <u>WaveForms SDK</u> . For more information visit <u>Diglent T&M Reference Page</u> . Observations are welcome on Test and Measurement Forum.
Wavegen Recent:	
1 Supplies	
V- Voltmeter	
√ [\] Logger	
Logic	
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JS } Script Open last session on start	DIGILENT. Digiteret is now part of Emersion.
🁸 Manual T	Trigger Discovery2 C SN:210321A1A476 🕲 100 MHz 、 Status: OK 、 😻 v3.23.4

- Add a tool
 - Select the Welcome +

😽 Wave	orm	s (new workspa	ce)		
Workspace	Co	ontrol Settings	1	Window	Help
Welcome		🕑 Help			
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- Create a DC supply voltage Supplies
 - Uses V+ and V- as outputs
 - V+ (500mV \rightarrow 5V), V- (-5V \rightarrow -500mV)
 - We will only use the positive supply
 - Process
 - 1. Select Welcome + \rightarrow Supplies
 - 2. Turn off all 3 supply enables
 - 3. Select the desired supply voltage
 - 4. Enable the Positive Supply
 - 5. Enable the Master Enable

Only enable the power supplies after connecting ALL of your circuit component

© ti





- Measure a DC voltage Voltmeter
 - Uses the 1+ and 2+ inputs
 - Process
 - 1. Select Welcome + \rightarrow Voltmeter
 - 2. Select a measurement update rate
 - 3. Select run



- Create an Analog Signal Wavegen
 - Creates time-varying voltage signals
 - 2 Channels available (W1, W2)
 - Process
 - 1. Select Welcome + \rightarrow Wavegen
 - 2. Select a waveform type
 - Select the signal characteristics NOTE:

Amplitude is +/-A 0-2v signal would be set to:

Amplitude: 1v, Offset: 1v

- 4. Select Run
- Adjust the controls as necessary



	<u>e</u>			
~	Channel 1 (W1)			
(4)	🕨 Run	🕗 Enable	Simple ~	Id
-	Type:	∕∕Sine	~ 🚯	
	Frequency:	1 kHz	~	Ē
	Period:	1 ms	\sim	Ē
	Amplitude:	1 V	(3) ~	
	Offset:	1 V		
	Symmetry:	50 %	~	Ē
	Phase:	0 °	~	Ē
				Ŀ

- Measure a time varying signal Scope
 - Simplified for CPE1500
 - Measures time-varying voltage signals
 - Uses the 1+ and 2+ inputs
 - Process
 - 1. Select Welcome + \rightarrow Scope
 - Select a time scale appropriate for the expected signal(s) time per graph division
 - 3. Select voltage ranges appropriate for the expected signal(s) volts WaveForms (new workspace)
 - 4. Select Run
 - Adjust the controls as necessary



→	
🗹 Time	۵.
Position:	0 s 🗸 🗸
Base:	1 ms/div 🤈 🗸
👃 Rate, Sa	amples
S Options	•
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< Channel	1 (1±) 🚯
Offset:	0V
Range:	500 mV/div 3
🗹 Channel	2 (2±) 💿
Offset:	0V 🗸
Range:	500 mV/div
IFilters	Uavegens

- Measure a time varying signal Scope
 - Simplified for CPE1500



- Create digital signals Patterns
 - 1 pin signals
 - Creates time varying digital signals
 - Uses the 16 digital I/O pins (0 15)
 - Process
 - 1. Select Welcome + → Patterns
 - 2. Select + to choose Signal
 - 3. Select the pin to use (rename it if you wish)

Name

DIO 0

Trigger: None

Pin

DIO 0

Output

PP

: Show

- 4. Select the output to be PP (push-pull)
- 5. Select the signal type
- 6. Select the Frequency
- 7. Select Run



The Control	WINDOW		
🕨 Run	Trig		
(
Signal			
2 Bus	els		
ROM Logi	V Add signal	×	
170.5 2 1	- Add Signar		4
1011111	Name:		
Vait:	DIO 10 DIO 9 DIO 8 DIO 7 DIO 6 DIO 5 DIO 4 DIO 3 DIO 2 DIO 1 DIO 0)	
	Add	Cancel	
	-		-

✓ F Rising

2 kHz

Type

Clock

Constant Clock Pulse Random Custom

- Create digital signals Patterns
 - Multi-pin signals (Bus)
 - Creates time varying digital signals
 - Uses the 16 digital I/O pins (0 15)
 - Process

7.

2 [MSB]

0 [LSB]

1

Trigger: None

Show

DIO

- 1. Select Welcome + \rightarrow Logic
- 2. Select + to choose Bus
- 3. Select the pins to use (add to right column) order from MSB at top to LSB at bottom

Run:

Show

continuous

1 ms/div

Auto Repeat: infinite

4. Select the output to be PP (push-pull)

6

1 kHz

Auto

Ready

- 5. Select the signal type
- 6. Select the Frequency

✓ F Rising

5

Туре

Binary Counter

Number

Clock

Pulse

Randon

Custom

Binary Counter Gray Counter Johnson Counter Walking 1

4

PP

	2	3	4	5	6	7
9	10	11	12	13	14	15
	9	9 10	I I I 9 10 11	9 10 11 12	9 10 11 12 13	9 10 11 12 13 14





- Measure Digital Signals Logic
 - 1 pin signals
 - Measures time varying digital signals
 - Uses the 16 digital I/O pins (0 15)
 - Process
 - Select Welcome + \rightarrow Logic 1.
 - 2. Select + to choose Signal

3.	Select the pin to use (rename it if you wish)	M Add	signal
4.	Select Single or Run	Name:	
4		DIO 10 DIO 9	
Single	Mode: Image: Buffer: Mormal Trigger: Normal Simple Pulse Protocol Position: 0 s Samples: Default Image: Default Image: De	DIO 8 DIO 7 DIO 6	\frown
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010 0		DIO 2 DIO 1 DIO 0	

Cancel

📉 , Т.

Add

Signal Bus

SPI

I2C

SPI MOSI/MISO

- Measure Digital Signals Logic
 - Multi-pin signals
 - Measures time varying digital signals
 - Uses the 16 digital I/O pins (0 15)
 - Process
 - 1. Select Welcome + \rightarrow Logic
 - 2. Select + to choose Bus
 - 3. Select the pins to use (add to right column)
 - 4. Select Single or Run

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	1			DIO 10	X																						Add	Cancel	
	0 [LSB]			DIO 9	Х						1		Г							1									





DIO 11

DIO 10

Available

DIO 8

DIO 7

DIO 6

- Measure Digital Signals Logic
 - Measures time varying digital signals

W WaveForms (new workspace) — — X Workspace Control Settings Window Help ■ Patterns 1 No Ele Control View Window ● ● ●
Workspace Cgntrol Settings Window Help Welcome Image: Help Image: Patterns 1 Image: Logic 1 Image: Help Ele Control View Window Image: Help Image: Help Events Data Events Control Control King Image: Help
Welcome • Help • Help • Patterns 1 • Logic 1 • Lo
Ele Control View Window
Create Data Data Create Managements Logica Country Nation
Export Rec. Data Events measurements Logging Counter Cursors Notes -
Mode: Organization Organization Os Samples Default Os Single Protocol Position: 0 s Samples: Default Samples:
+ , - , N , T ,
Name Pin T Done 4096 samples at 400 kHz 2024-11-26 16:01:53.292 (16/16bit) 🔝 📺 🧮 🛞 🔺
- Bus 🖸 0 1 2 3 4 5 6 7 0 1
Try_it
Setup a pattern with the pattern gen
Setup a pattern with the pattern gen
Connect the digital inputs to the patt
generator outputs
generator outputs
x → -5 ms -4 ms -3 ms -2 ms -1 ms 0 m 1 ms 2 ms 3 ms 4 ms 5 ms

- Saving your settings
 - Workspace \rightarrow Save as
 - Select an appropriate location
- Restoring your settings
 - Workspace → Open
 - You will need to restart your patterns using Run