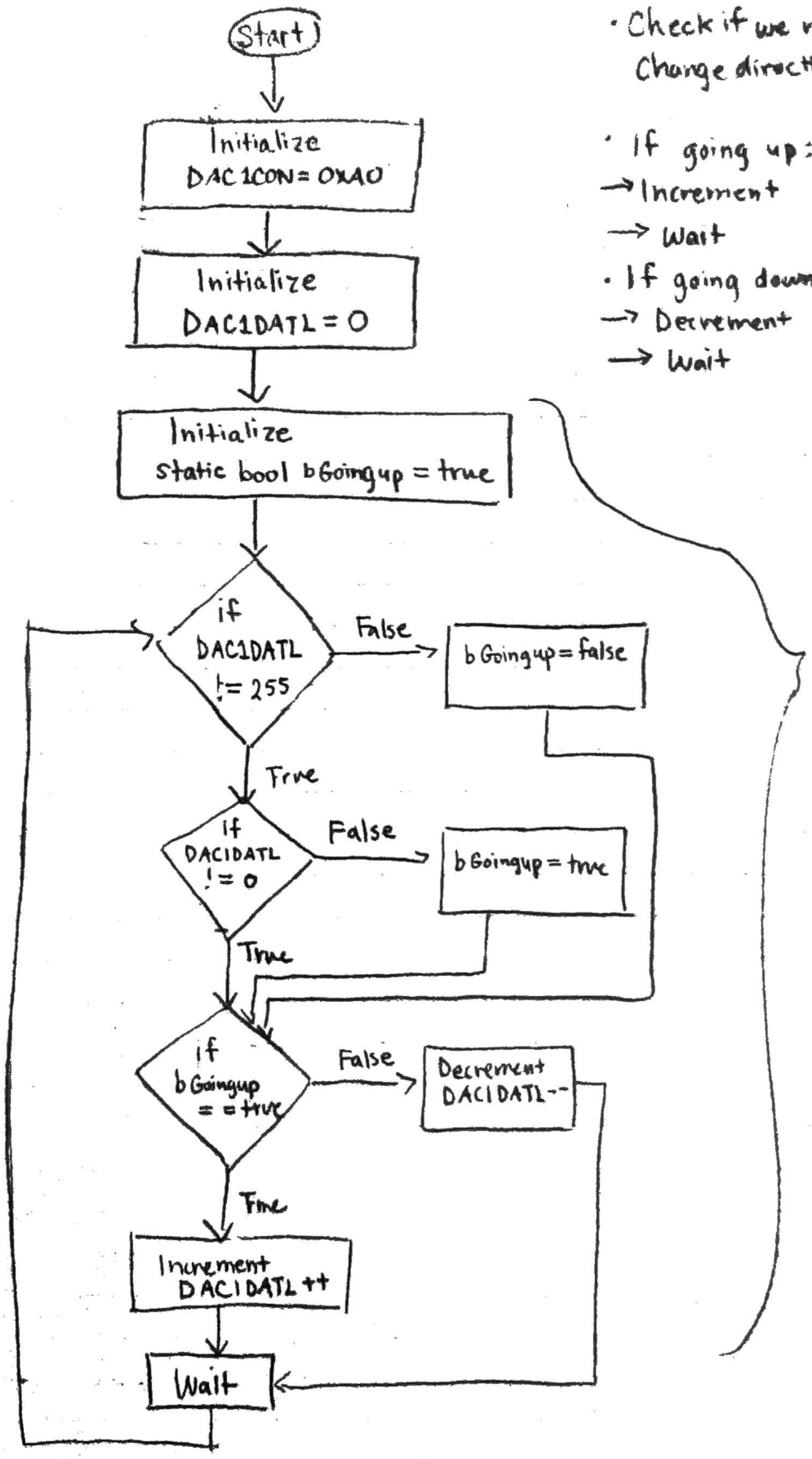
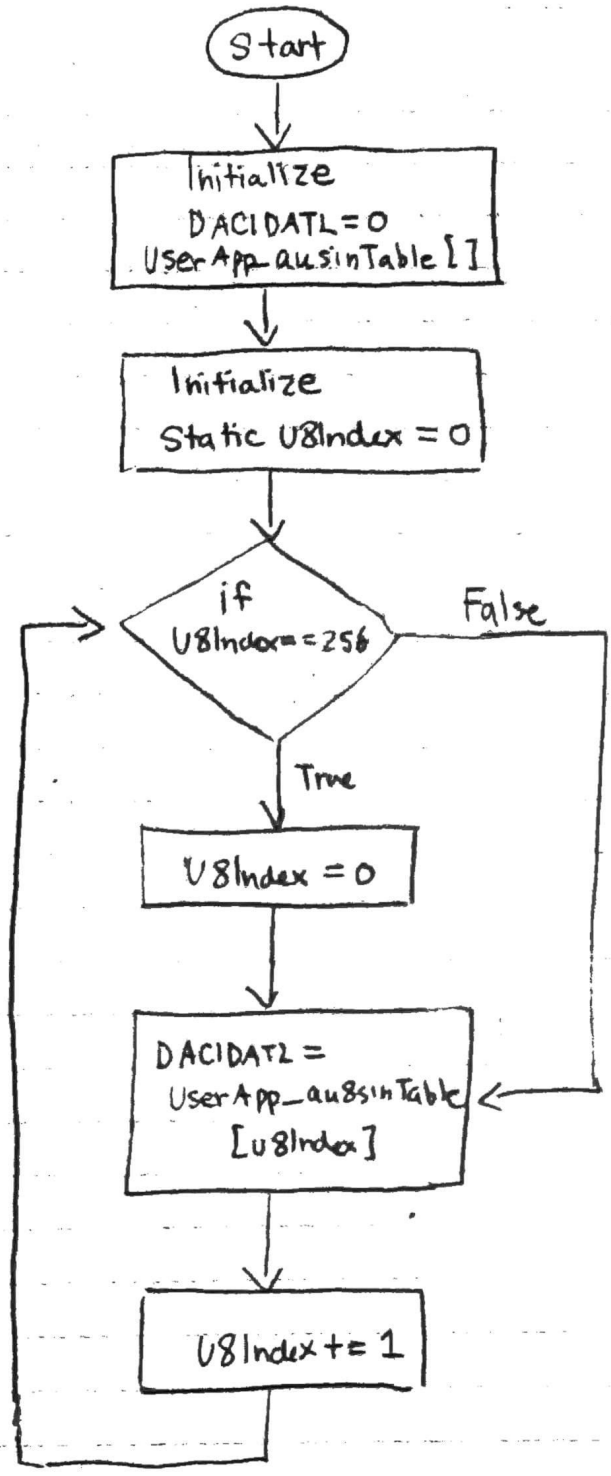
DESIGN DOCUMENTATION FOR TRIANGLE



- Check if we need to change direction
- If going up:
  → Increment
  → Wait
- If going down:
  → Decrement
  → Wait

In UserappRun

DESIGN DOCUMENTATION FOR SINUSOID



- Initialize sin table as global variable
- Check the index each time it is incremented When equal to 256 set U8Index = 0
- Set DACIDATL by indexing the sin table
- Increment Index

(Vref+ - Vref-)/resolution = 5v/256 = 0.01953125 V =19.5 mv
T = 1/(1x10^3) = 0.001s -> 1 ms

This is for sawtooth

- 1ms/256 = 0.00390625 ms or 4 microseconds
- Increment 4 microseconds and then take a step of 19.5mv then repeat
- Increment, wait, check at the end
- 0.000004 x 256 = 0.001024 ms -> 1/0.001024= 976 Hz instead of 1 KHz

This is for triangle

- We need to change the system tick double 2
- We need to do 2 things in the same amount of time so we need to do things twice as fast
- You want to increment DAC1DATL when you reach DAC1DATL = 255 then you make the Boolean false
- You want to decrement DAC1DATL when you reach DAC1DATL = 0 then you make the Boolean true

Increment-> wait -> check

-We want the DAC enabled
-RA2 output
-Vdd positive reference
-Vss negative reference
-DACxCON = 1X1000X0 -> 10100000 =0xA0
-DAC1CON “x” = 1

<u>TRIANGLE WAVE DESIGN DOCUMENTATION</u>
UserAppRun:

LOOP 1
Start at 0

Increment

Wait

Check if we are at the top and change direction to down if we are

LOOP 2
Decrement

Wait

Check if we are at the bottom and change direction to up if we are

Alternatively:
UserAppRun:

Check if we need to change direction

If we're going up:
Increment

Wait

If we're going down:
Decrement

Wait

Sinusoid

- 64 steps for 1ms -> 1ms/64= 0.0156 ms. Or 15.6 us
- Test the value in TimeXus()

SINUSOID WAVE DESIGN DOCUMENTATION

UserAppRun:

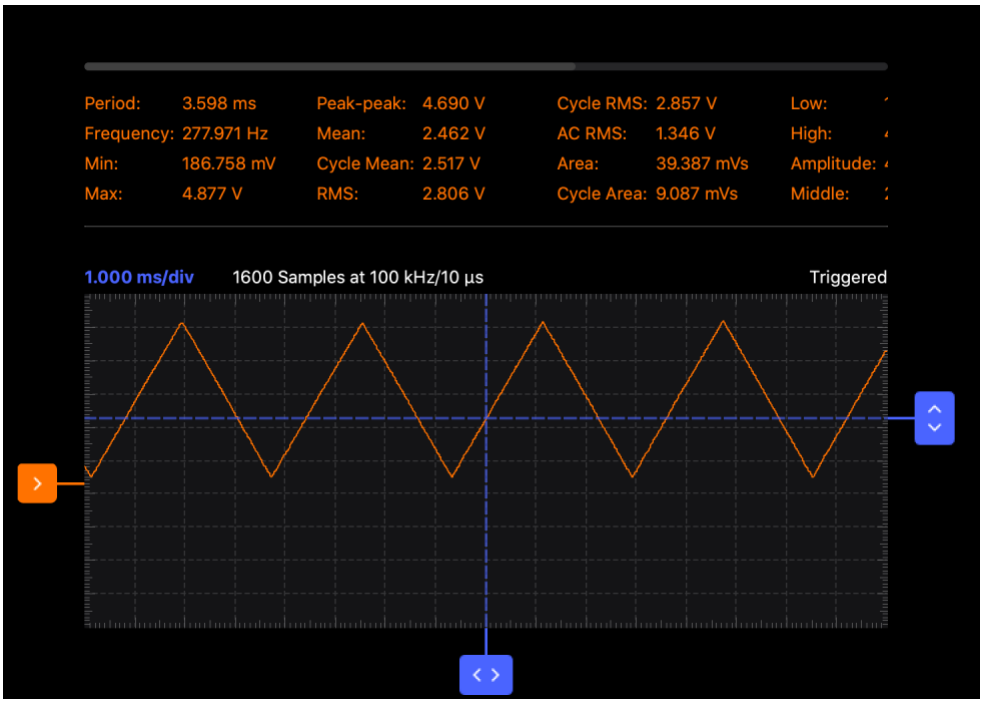
Check the index if it is equal to 256

If index equal to 256 set index back to 0

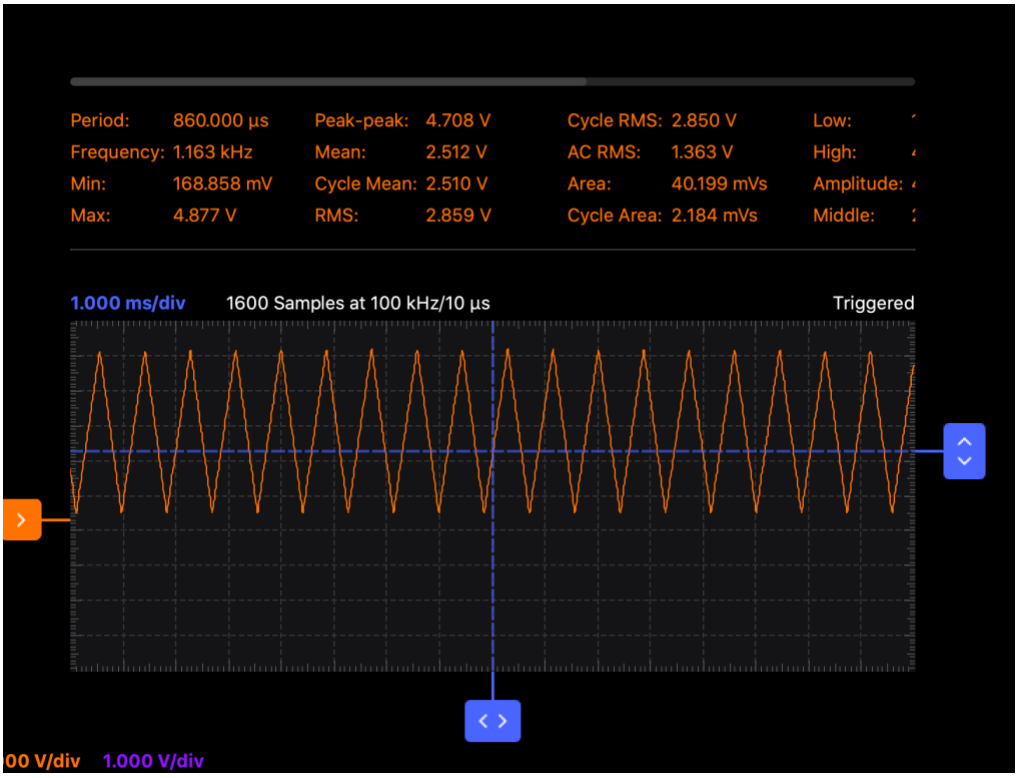
Set DAC1DATL by indexing sin table

Wait

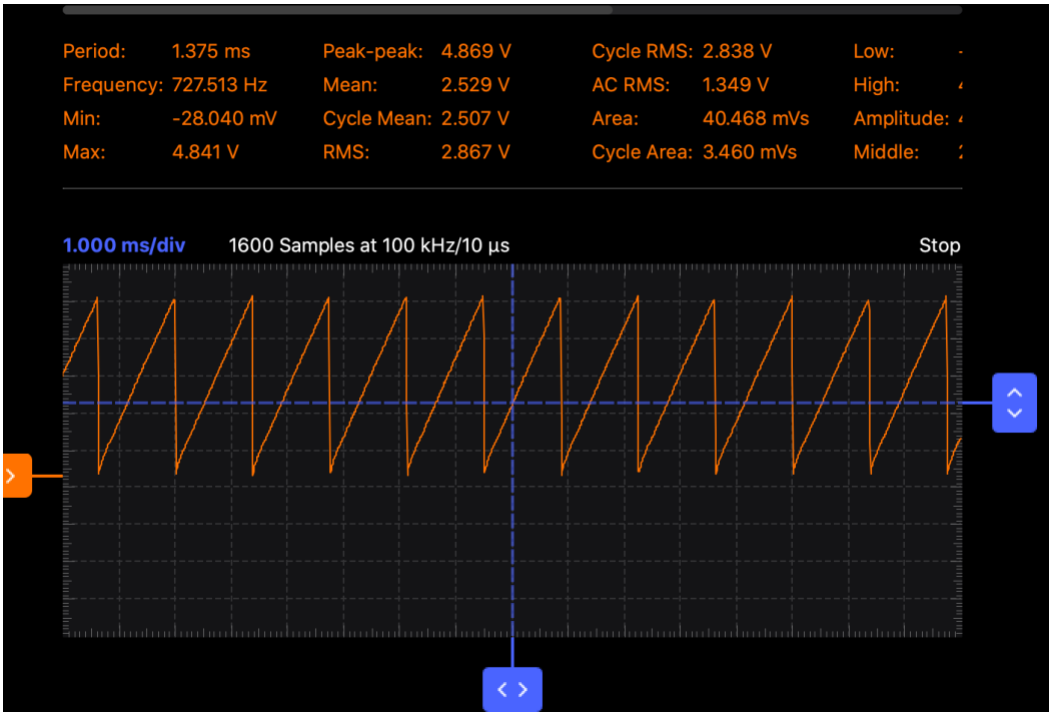
Increment index



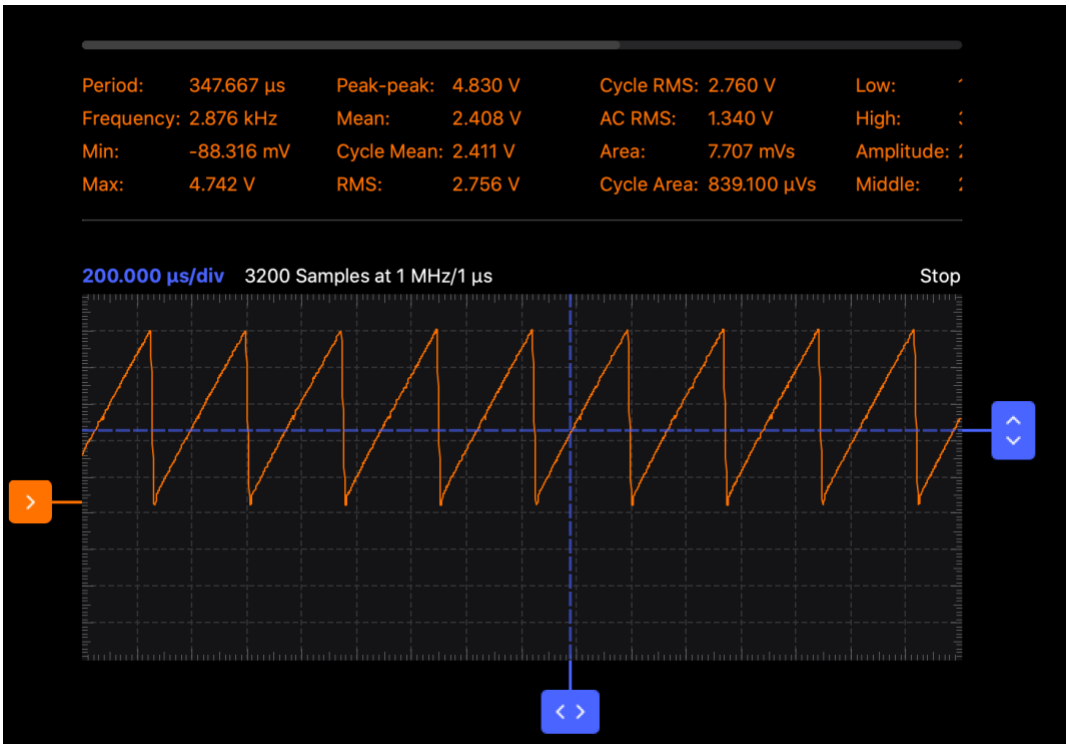
Low Frequency Triangle Wave



Adjusted Frequency of Triangle Wave

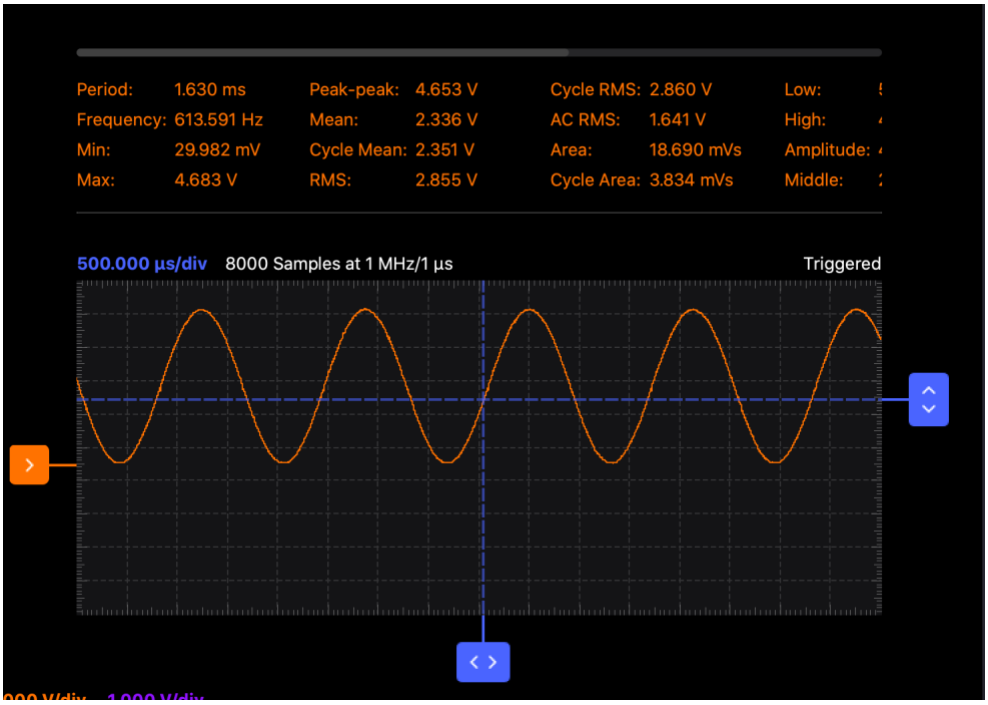


Sawtooth Wave with 256 steps

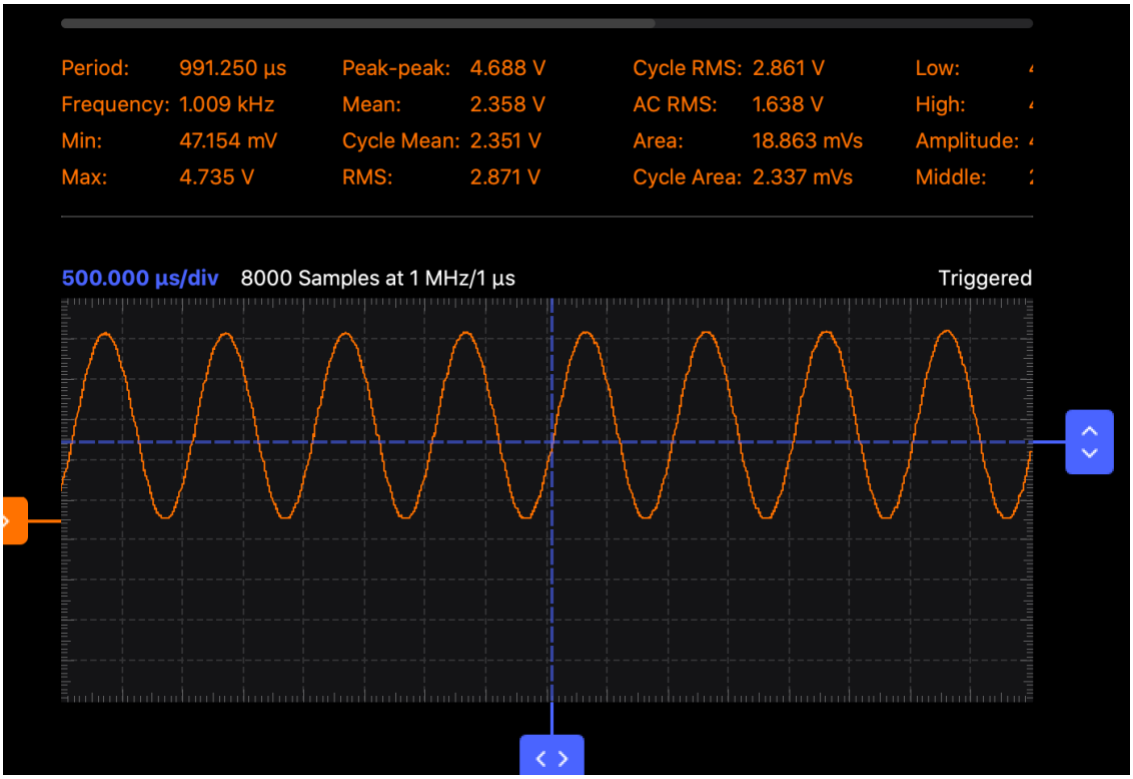


Sawtooth with 64 steps

Sawtooth with 64 steps zoomed in



Sinusoid



Sinusoid close to 1KHz