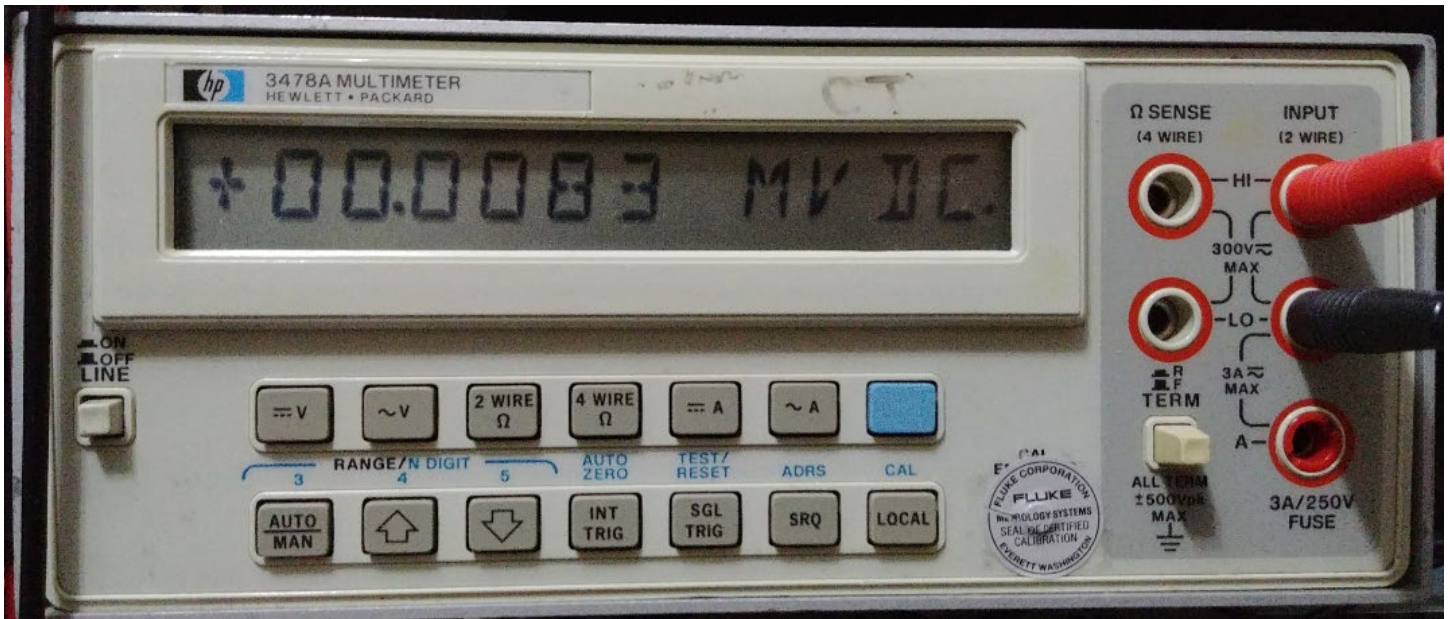HP 3478A Control and Data Logging Software Manual
Created by Nirav Patel.
Email: niravkp97@gmail.com
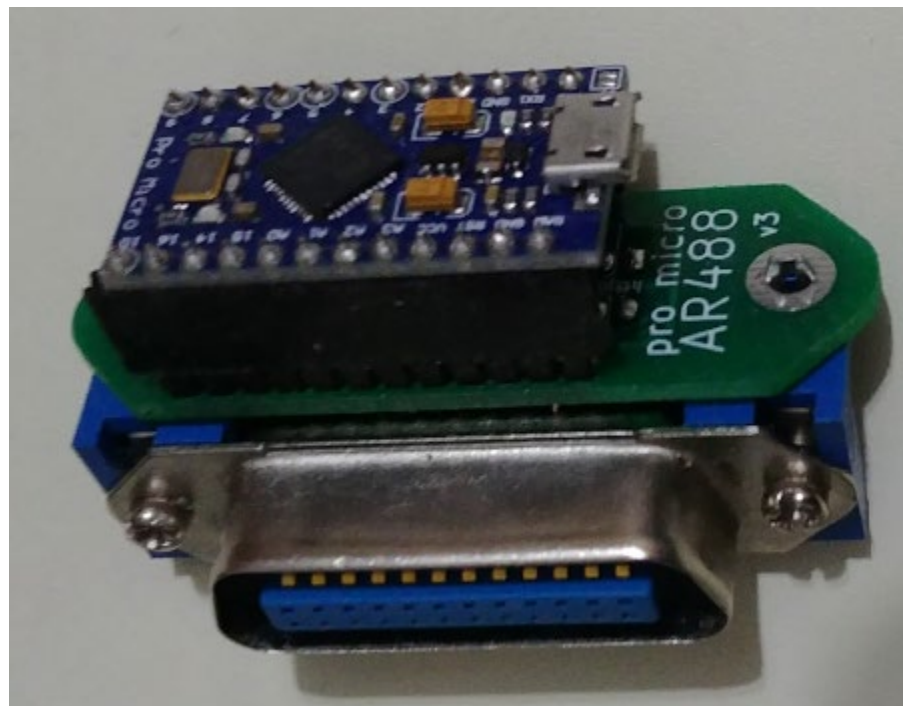
Before you get started make sure you have an AR488 Arduino GPIB adapter
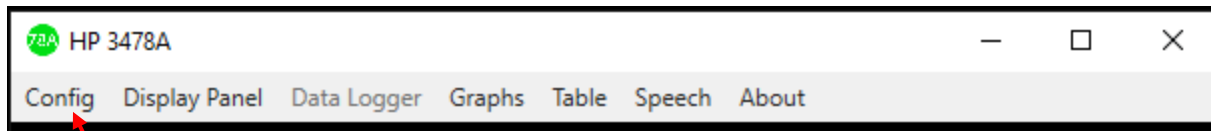and a HP 3478A multimeter.

Table of Contents

You will need this multimeter to use the software.

You will also need this AR488 GPIB Adapter.

How to connect a HP3478A to the software?

Warning: Make sure that you have a AR488 Arduino GPIB adapter connected to the HP 3478A and that your computer recognizes the COM Port.

Open the software and click of the Config menu.
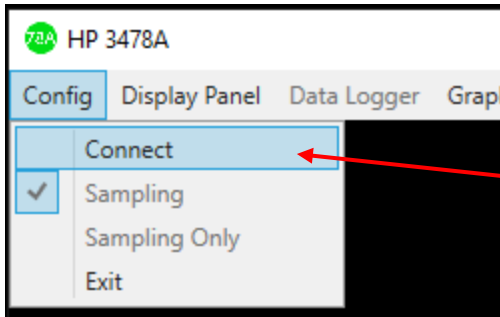
Then click the Connect option, this will open a COM Select window.
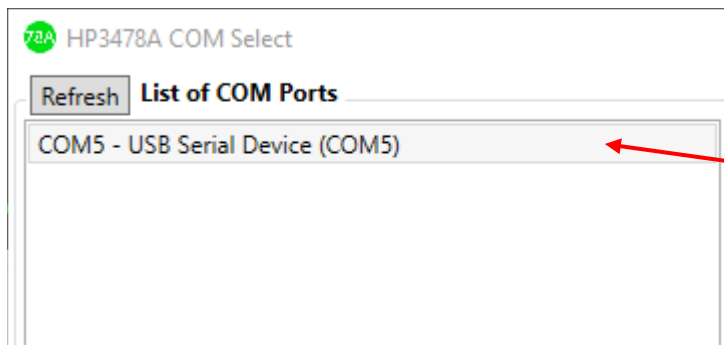
Then double click on the COM Port from the list that is associated with the AR488 GPIB Adapter that is connected to your HP 3478A multimeter.

Then make sure the GPIB Address is correct. If it is not, then type the correct GPIB Address number.

Info Log [Clear]

Test Data will be saved inside the software directory.
C:\Users\nirav\Desktop\Release\Log Data (HP3478A)
Click the Select button to select another directory.
Make sure GPIB Address is correct.
Choose the correct COM port from the list.
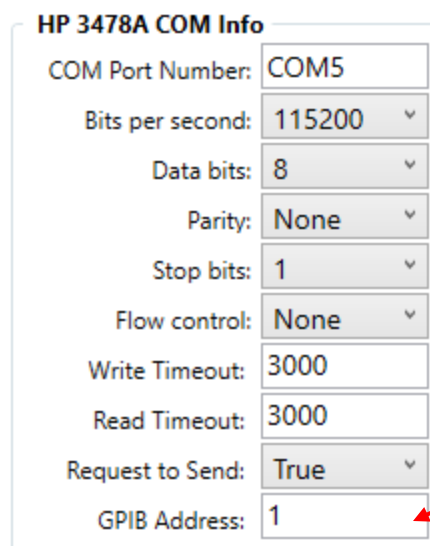Try AR488 ++rst button to reset the Adpater.
Click the Connect button when you are ready.
[Success] COM5 is open and ready for communication.
[Success] AR488 GPIB controller, ver. 0.49.12, 11/01/2021
[Success] Current GPIB Address: 1

Make sure the software can communicate with the AR488 Adapter.

AR488 Config

Log Data Directory:	Select
AR488 Version:	++ver
AR488 Reset:	++rst
AR488 GPIB Address:	++addr
Verify HP3478A:	++read
Connect	

Finally click the Connect button, if all the settings are valid then the software will verify if a HP3478A is connect to the AR488 adapter and start the software.

Features of the Main Software

Options regarding the display panel. You can change display panel's colors, measurement format and more.

Options regarding the data logging capability. Data logging is enabled by default.

Opens the Graphing Module.

Opens the Measurement Table.

Enables Speech Synthesizer, select male/female voice, set voice measurement resolution and more.
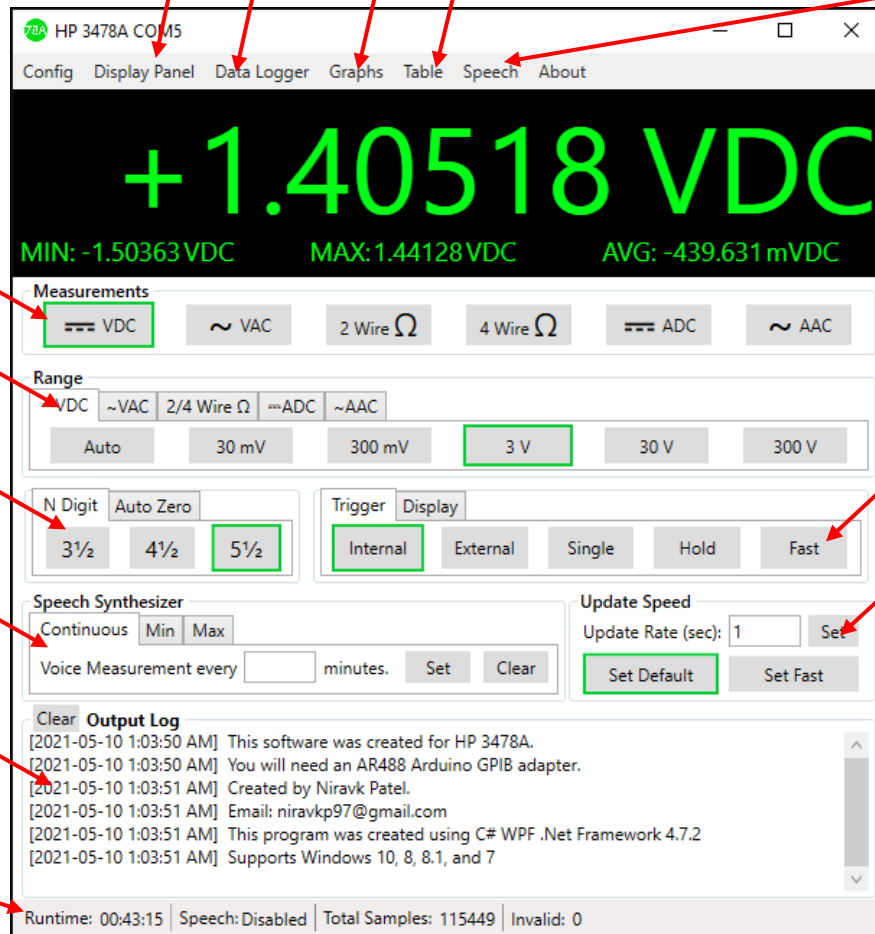
Select Measurement type.

Select Measurement Range.

Select Resolution and turn Auto Zero on/off.

Set Speech Synthesizer to voice periodically or when min or max.

Important information will be displayed here.

Show software runtime and total samples captured.

Select Trigger. Single, Hold and Fast are not supported.

Set Update Speed.

HP 3478A COM5

+1.40518 VDC

MIN: -1.50363 VDC   MAX: 1.44128 VDC   AVG: -439.631 mVDC

Measurements
VDC | VAC | 2 Wire Ω | 4 Wire Ω | ADC | AAC

Range
VDC | ~VAC | 2/4 Wire Ω | ~ADC | ~AAC
Auto | 30 mV | 300 mV | 3 V | 30 V | 300 V

N Digit | Auto Zero
3½ | 4½ | 5½

Trigger | Display
Internal | External | Single | Hold | Fast

Speech Synthesizer
Continuous | Min | Max
Voice Measurement every ___ minutes.   Set   Clear

Update Speed
Update Rate (sec): 1   Set
Set Default   Set Fast

Clear Output Log
[2021-05-10 1:03:50 AM] This software was created for HP 3478A.
[2021-05-10 1:03:50 AM] You will need an AR488 Arduino GPIB adapter.
[2021-05-10 1:03:51 AM] Created by Niravk Patel.
[2021-05-10 1:03:51 AM] Email: niravkp97@gmail.com
[2021-05-10 1:03:51 AM] This program was created using C# WPF .Net Framework 4.7.2
[2021-05-10 1:03:51 AM] Supports Windows 10, 8, 8.1, and 7

Runtime: 00:43:15 | Speech: Disabled | Total Samples: 115449 | Invalid: 0

How to achieve maximum sampling capture speed?
= Set Auto Zero off, set N Digit to 3, Set Trigger to Internal, Set Display to OFF, Select Manual Range, then go to the Config menu and select Sampling Only option. This will allow you set capture samples as fast as possible.

Speech Synthesizer only works correctly on Windows 10. Windows 7 user should leave this feature disabled.

You can reset MIN, MAX, and AVG by double clicking on them.

Features of the Measurement Table

#	Date Time	Measurement	Unit
300	2021-05-10 1:08:43 AM	-2.004	VDC
301	2021-05-10 1:08:43 AM	-2.02	VDC
302	2021-05-10 1:08:43 AM	-2.027	VDC
303	2021-05-10 1:08:43 AM	-2.004	VDC
304	2021-05-10 1:08:43 AM	-1.951	VDC
305	2021-05-10 1:08:43 AM	-1.869	VDC
306	2021-05-10 1:08:43 AM	-1.76	VDC
307	2021-05-10 1:08:43 AM	-1.625	VDC
308	2021-05-10 1:08:43 AM	-1.54	VDC
309	2021-05-10 1:08:43 AM	-1.363	VDC
310	2021-05-10 1:08:43 AM	-1.171	VDC
311	2021-05-10 1:08:43 AM	-0.964	VDC
312	2021-05-10 1:08:43 AM	-0.741	VDC
313	2021-05-10 1:08:43 AM	-0.507	VDC
314	2021-05-10 1:08:43 AM	-0.269	VDC
315	2021-05-10 1:08:43 AM	-0.146	VDC
316	2021-05-10 1:08:43 AM	0.097	VDC
317	2021-05-10 1:08:43 AM	0.335	VDC
318	2021-05-10 1:08:43 AM	0.568	VDC
319	2021-05-10 1:08:43 AM	0.787	VDC
320	2021-05-10 1:08:43 AM	0.995	VDC
321	2021-05-10 1:08:43 AM	1.194	VDC
322	2021-05-10 1:08:43 AM	1.373	VDC

HP 3478A COM5

File   Table   Table Colors

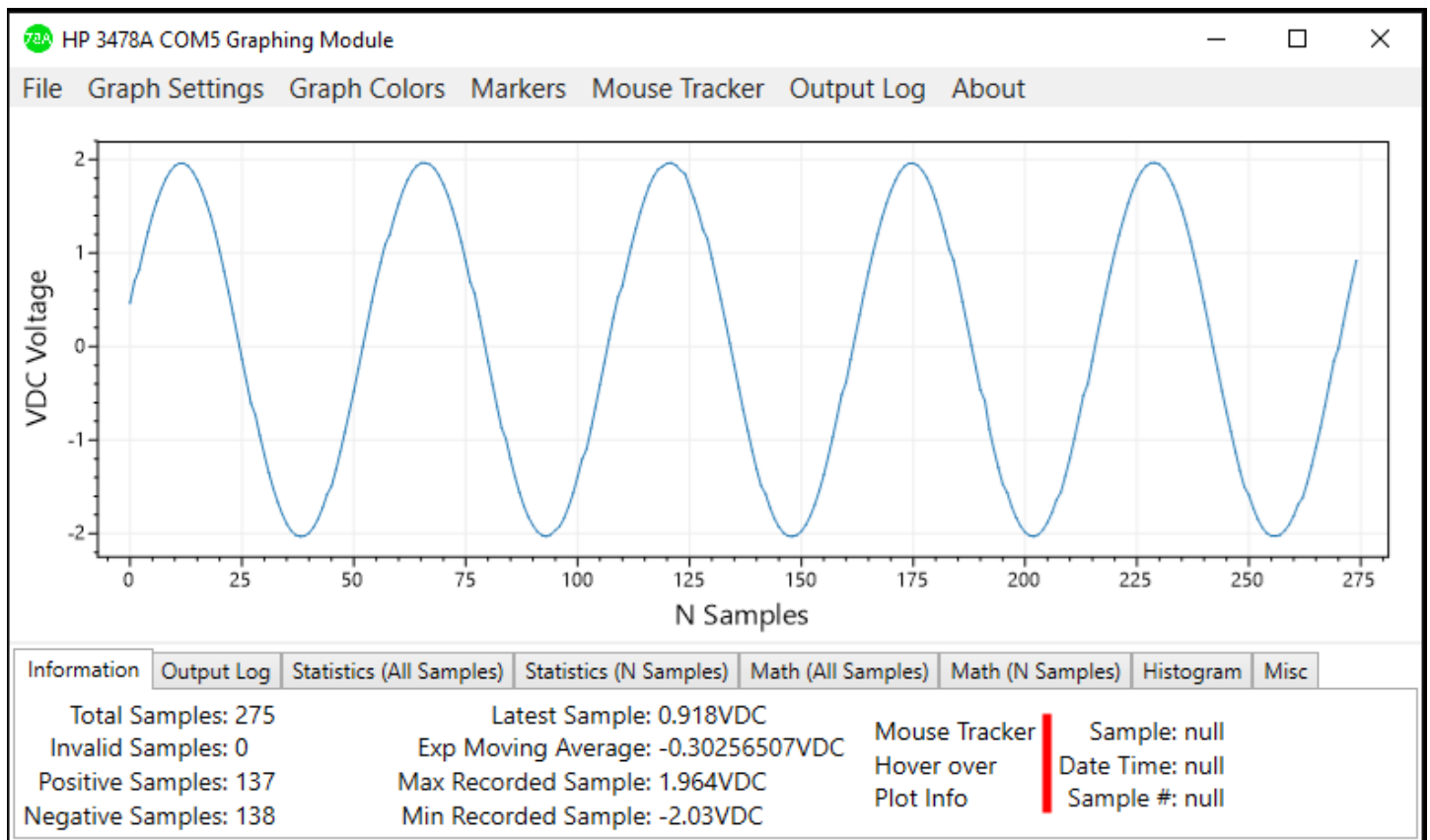Total Measurement: 322

Set the Table's Cell's colors.

You can clear the table from here.

Data is displayed in cells. These cells can be edited.

Save data from the table into text file or CSV file.

Features of the Graphing Module

The graphing module is the main feature of the software. You can pan, zoom and highlight an area and zoom into it. The graph has natural pan and zoom capabilities, like how you can zoom and pan in Google Maps. There are too many features for me to list them here. You can reset the graph by going to Graph Settings then click Reset Graph.

Sample information is displayed here, you can get the date and time of each sample by Enabling the Mouse Tracker from the mouse tracker menu.

Important information will be displayed here. You can save the contents of this log by going to the Output Log menu.

Information	Output Log	Statistics (All Samples)	Statistics (N Samples)	Math (All Samples)	Math (N Samples)	Histogram	Misc

Mean (Average):	Calculate	|Max| Sample:	Calculate	Geometric Mean:	Calculate	Mean Std Deviation:	Calculate
Std Deviation:	Calculate	|Min| Sample:	Calculate	Harmonic Mean:	Calculate	Mean Variance:	Calculate
Max Sample:	Find	Root Mean Square:	Calculate	Pop Variance:	Calculate		
Min Sample:	Find	Variance:	Calculate	Pop Std Deviation:	Calculate		

Get statistics for all the samples captures so far.

Information	Output Log	Statistics (All Samples)	Statistics (N Samples)	Math (All Samples)	Math (N Samples)	Histogram	Misc

N Samples [Start , End]		Max Sample:	Find	Root Mean Square:	Calculate	Pop Variance:	Calculate
0 , 50		Min Sample:	Find	Variance:	Calculate	Pop Std Deviation:	Calculate
Mean (Average):	Calculate	|Max| Sample:	Calculate	Geometric Mean:	Calculate	Mean Std Deviation:	Calculate
Std Deviation:	Calculate	|Min| Sample:	Calculate	Harmonic Mean:	Calculate	Mean Variance:	Calculate

Get statistics for select few samples. You can enable vertical markers to help you with selecting the start and ending sample numbers. This will calculate statistics for all the samples between two samples.

Information	Output Log	Statistics (All Samples)	Statistics (N Samples)	Math (All Samples)	Math (N Samples)	Histogram	Misc

Addition (Samples + Value ⌄):		Calculate	Graph Title:	
Subtraction (Samples - Value ⌄):		Calculate	Y-Axis Label:	
Multiplication (Samples * Value ⌄):		Calculate	Graph Color:	50 255 30 Set Randomize
Division (Samples / Value ⌄):		Calculate		

Create Math Waveforms with all the samples captured so far.

Information	Output Log	Statistics (All Samples)	Statistics (N Samples)	Math (All Samples)	Math (N Samples)	Histogram	Misc

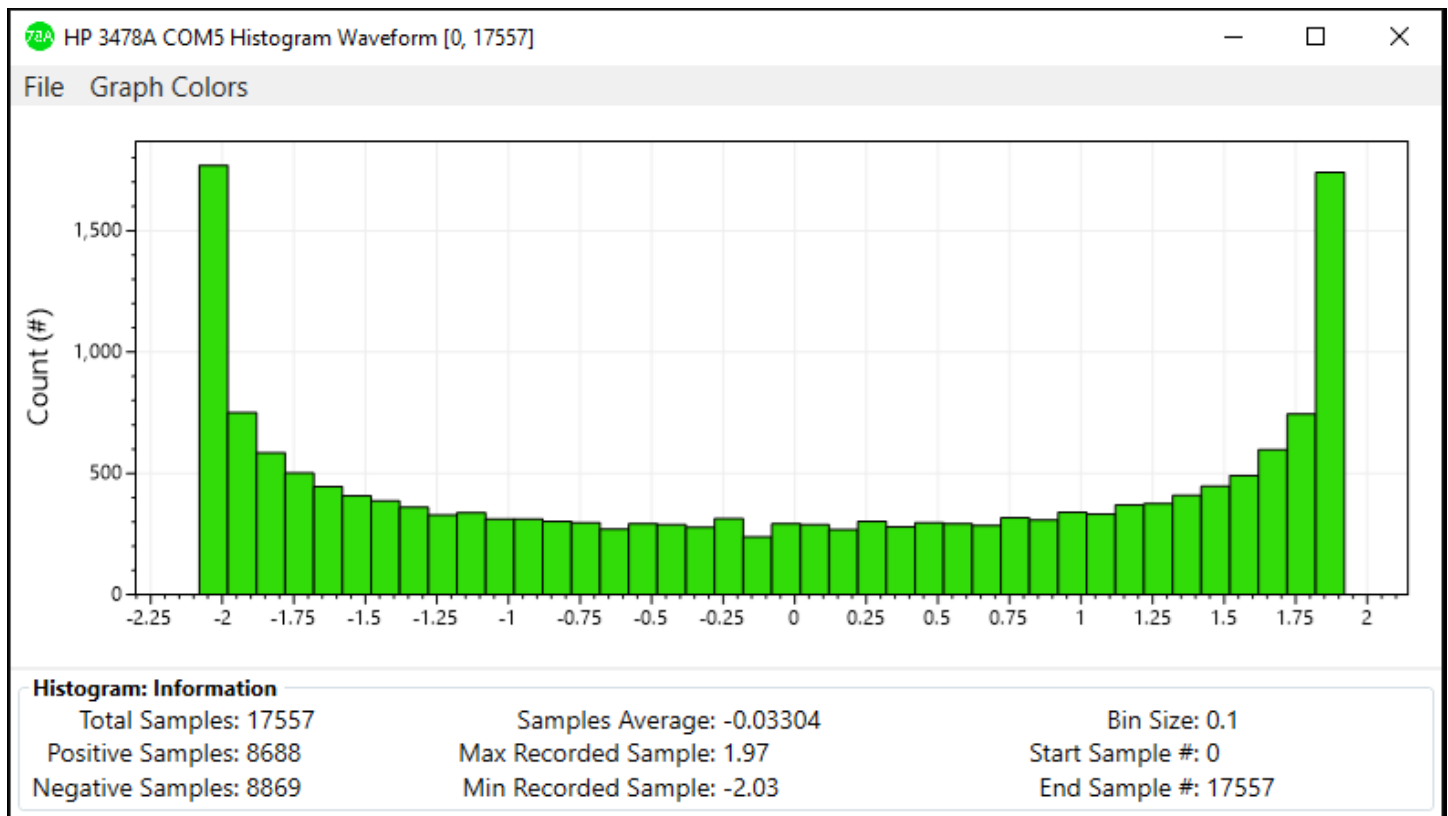| Addition (Samples + Value ⌄):		Calculate	N Samples (Start, End):	,
Subtraction (Samples - Value ⌄):		Calculate	Graph Title:	
Multiplication (Samples * Value ⌄):		Calculate	Y-Axis Label:	
Division (Samples / Value ⌄):		Calculate	Graph Color:	30 144 255 Set Randomize

Create Math Waveforms for select few samples. This will create a math waveform for all the samples between two samples.

Information	Output Log	Statistics (All Samples)	Statistics (N Samples)	Math (All Samples)	Math (N Samples)	Histogram	Misc

[All Samples]:	Calculate	Bin Size:	0.1	Plot Curve: ☐
[N Samples (Start, End)]:	Calculate	Bar Width:	0	Graph Title:
,		Bar Border Thickness:	1	X-Axis Label:
		Graph Color:	30 144 255 Set Randomize	

Create Histogram for all the samples or for select few samples. Make sure to type the appropriate bin size.

Information	Output Log	Statistics (All Samples)	Statistics (N Samples)	Math (All Samples)	Math (N Samples)	Histogram	Misc

Δ Time [All Samples]:	Seconds ⌄	Calculate
Δ Time [N Samples (Start, End)]:	Seconds ⌄	Calculate
,		

Calculate the time different between two samples. The All-Samples option will calculate time difference between the first sample and the current last sample.

HP 3478A COM5 Histogram Waveform [0, 17557]

File   Graph Colors

Histogram: Information

Total Samples: 17557	Samples Average: -0.03304	Bin Size: 0.1
Positive Samples: 8688	Max Recorded Sample: 1.97	Start Sample #: 0
Negative Samples: 8869	Min Recorded Sample: -2.03	End Sample #: 17557

You can create Histogram from all the samples or for select few samples. Pan, zoom, and zoom to highlighted area is also possible.