Lab 4: Recording Frequencies of SD Card

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Lab 4 Serial Monitor Results

Conclusion: Max Write Frequency to SD Card = 1 Microsecond based on Runtime Readings

We can see below that when we adjust the microsecond delay from 1 to .1, the runtime numbers indicate it is not recording faster than it did at a delay of 1 microsecond vs the change from 10 microseconds to 1 microsecond.

Delay @ .1 Microsecond				Delay @ 1 Microsecond				Delay @ 10 Microseconds		
Temp(c)	Resistance(0hm)	RUNTIME		Temp(c)	Resistance(0hm)	RUNTIME		Temp(c)	Resistance(0hm)	RUNTIME
24.49	10226.05	33324		23.46	10702.7	33324		34.1	6777.89	32284
24.76	10107.53	58284		23.21	10822.51	58284		34.5	6666.67	56204
24.49	10226.05	83244		23.46	10702.7	83244		33.71	6889.35	80124
24.76	10107.53	108204		23.46	10702.7	108204		34.1	6777.89	104044
24.49	10226.05	134204		23.21	10822.51	134204		34.1	6777.89	129004
24.76	10107.53	160204		23.46	10702.7	160204		34.1	6777.89	153964
24.76	10107.53	186204		23.46	10702.7	186204		34.5	6666.67	178924
24.49	10226.05	212204		23.46	10702.7	212204		33.33	7001.04	203884
24.76	10107.53	238204		22.96	10942.58	238204		33.33	7001.04	228844
24.76	10107.53	264208		23.21	10822.51	264212		33.33	7001.04	253804
24.23	10344.83	290204		22.96	10942.58	290204		32.95	7112.97	278764
24.49	10226.05	316204		23.21	10822.51	316204		34.1	6777.89	303724
24.49	10226.05	342204		23.46	10702.7	342204		33.33	7001.04	328684
24.23	10344.83	368204		23.46	10702.7	368204		33.33	7001.04	353644
24.23	10344.83	394204		23.21	10822.51	394204		33.33	7001.04	378604
24.76	10107.53	420204		23.21	10822.51	420204		34.1	6777.89	403564
24.49	10226.05	446204		23.46	10702.7	446204		33.33	7001.04	428524
24.49	10226.05	472204		23.21	10822.51	472204		32.57	7225.13	453484
24.76	10107.53	498204		23.46	10702.7	498204		34.1	6777.89	478444
24.49	10226.05	524204		23.46	10702.7	524204		32.57	7225.13	503404
24.49	10226.05	550204		23.46	10702.7	550204		33.71	6889.35	528364
24.49	10226.05	576204		23.46	10702.7	576204		33.33	7001.04	553324
24.49	10226.05	602204		23.46	10702.7	602204		33.33	7001.04	578284
24.49	10226.05	628204		23.21	10822.51	628204		34.1	6777.89	603244
24.49	10226.05	654204		23.46	10702.7	654204		34.1	6777.89	628204
24.23	10344.83	680204		23.46	10702.7	680204		31.84	7450.15	653164
24.23	10344.83	706204		23.46	10702.7	706204		34.5	6666.67	678124
24.49	10226.05	732204		23.46	10702.7	732204		33.33	7001.04	703084
24.49	10226.05	758204		23.21	10822.51	758204		35.74	6334.38	728044
24.49	10226.05	784204		23.46	10702.7	784204		32.95	7112.97	753004
24.49	10226.05	810204		23.46	10702.7	810204		34.5	6666.67	777964
24.49	10226.05	836204		23.46	10702.7	836204		33.71	6889.35	802924
24.49	10226.05	862204		23.46	10702.7	862204		34.1	6777.89	827884
24.76	10107.53	888204		22.96	10942.58	888204		32.95	7112.97	852844
24.49	10226.05	914204		23.46	10702.7	914204		34.91	6555.68	877804
24.76	10107.53	940204		23.46	10702.7	940204		34.1	6777.89	902764
24.49	10226.05	966204		23.46	10702.7	966204		34.1	6777.89	927724
24.49	10226.05	992204		22.96	10942.58	992204		33.33	7001.04	952684
24.23	10344.83	1018204		23.46	10702.7	1018204		33.71	6889.35	977644
24.23	10344.83	1045244		23.46	10702.7	1045244		33.71	6889.35	1002604

Possible reasons for a maximum frequency cap on an SD card could be:

- The amount of energy the device requires, which may be limited by the type of thermistor cable(s) utilized.
- Frequency compatibility the SD card is supported with other devices.
- The storage capacity of the SD card – such that SD cards near or at full storage run slower.
- The read mechanism utilized by the SD card – UHS-1, UHS-2, UHS-3, etc.
- Quality of materials for the SD card, like the metals and materials utilized for the circuit board & contacts.
- Room temperature affecting the performance and rates of transfer
- The processor may also affect the rate at which the SD card can be written to