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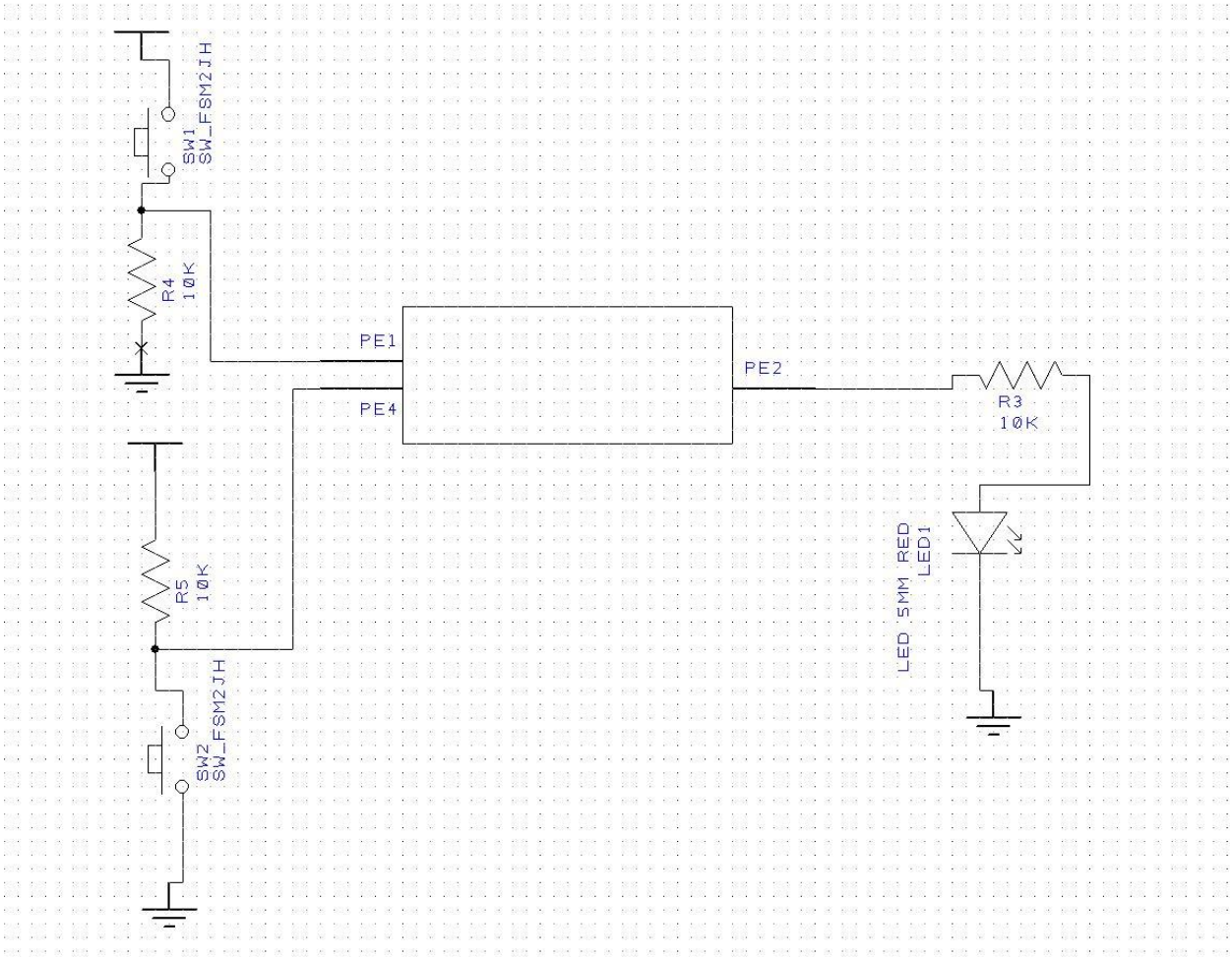
Lab 3 Deliverables

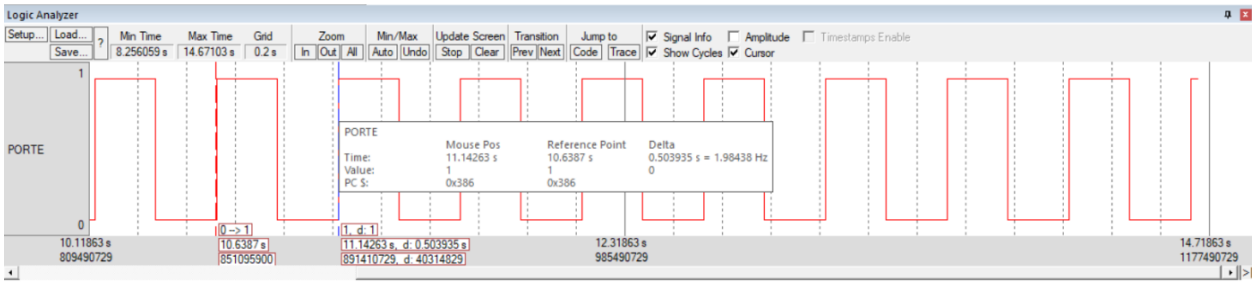
PART A - Circuit Diagram



PART B - Estimated LED Voltage & Current

Estimated Voltage Value (Vd): **Vd = 1.600170231 Volts**
Estimated Current Value (Id): **Id = 3.4046175 Amperes**
R=470, find Id & Vd; → Ohm's Law: Vd=Id*R; Vd=470Id → given equation in Lab Manual, Id=20*Vd - 32; Id = 20*(470Id) - 32 → Id = 0.0034046175 Amps → Id = 3.4046175 mAmps → Vd = Id * R → Vd = 3.4 * 470 → Vd = 1.600170231 Volts

PART C - Debugging Screenshot



PART D - Switch Measurements

Parameter	Value	Units	Conditions
Resistance of the 10kΩ resistor, R1	10000	ohms	with power off and disconnected from circuit (measured with ohmmeter)
Supply Voltage, $V_{+3.3}$	3.28	volts	Powered (measured with voltmeter)
Input Voltage, V_{PE1}	0	volts	Powered, but with switch not pressed (measured with voltmeter)
Resistor current	0	mA	Powered, but switch not pressed $I=V_{PE1}/R1$ (calculated and measured with an ammeter)
Input Voltage, V_{PE1}	3.28	volts	Powered and with switch pressed (measured with voltmeter)
			Powered and switch pressed

Resistor current	0.000328	mA	I=V_{PE1}/R1 (calculated and measured with an ammeter)

PART E - LED Measurements

Row	Parameter	Value	Units	Conditions
1	Resistance of the 470Ω resistor, R19	470	ohms	with power off and disconnected from circuit (measured with ohmmeter)
3	TM4C123 Output, V_{PE2} input to 470Ω	0	volts	with **PE2** = 0 (measured with voltmeter relative to ground). We call this V_{OL} of the TM4C123.
4	LED a+, V_{a+} Bottom side of R19 (anode side of LED)	0	volts	with **PE2** = 0 (measured with voltmeter relative to ground). This measurement is also weird, because it too is floating.
5	LED voltage	1.6	volts	calculated as V_{a+} - V_{k-} (V_k is ground).
6	LED current (off)	0	mA	calculated as (V_{OL} - V_{a+})/R19
7	TM4C123 Output, V_{PE2} input to 470Ω	2.9	volts	with **PE2** = 1 (measured with voltmeter relative to ground). We call this V_{OH} of the TM4C123. We

				previously assumed this was 3.2V.
8	LED a+, V_{a+} Bottom side of R19 (anode side of LED)	2.8	volts	with **PE2** = 1 (measured with voltmeter relative to ground)
9	LED voltage	1.62	volts	calculated as V_{a+} - V_k.(V_k is ground).
10	LED current (on)	2.76	mA	calculated as (V_{OH} - V_{a+})/R19
11	LED current (on)	5.03	mA	measured with an ammeter