

# EE 1st Projects – 2<sup>nd</sup> semester – spring 2016

## Project 03

### Output Interfacing to the Real World

#	Student ID	Student Name	Grade (10)
1 (bread bard)			
2 (PCB)			

Delivery Date	
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<p>١. يتم تسليم المشروع على bread board خلال أسبوع من نشرة ٢. يتم تسليم المشروع على PCB بعد أسبوعين من نشرة ٣. كل طالب يقوم بتسليم مشروع منفصل ٤. غير مسموح بالتأخير في تسليم المشاريع منعا لتداخل المشاريع و تراكمها</p>
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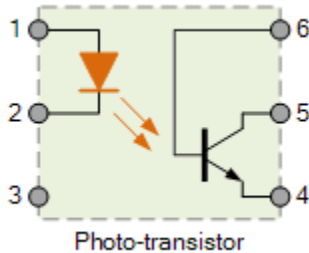
## Objective

An interface circuit allows one type of circuit to be connected to another type of circuit that may be of a different voltage or current rating. We can also interface output devices such as relays, magnetic solenoids and lights. Then interfacing output devices to electronic circuits is known commonly as: Output Interfacing.

## Theory

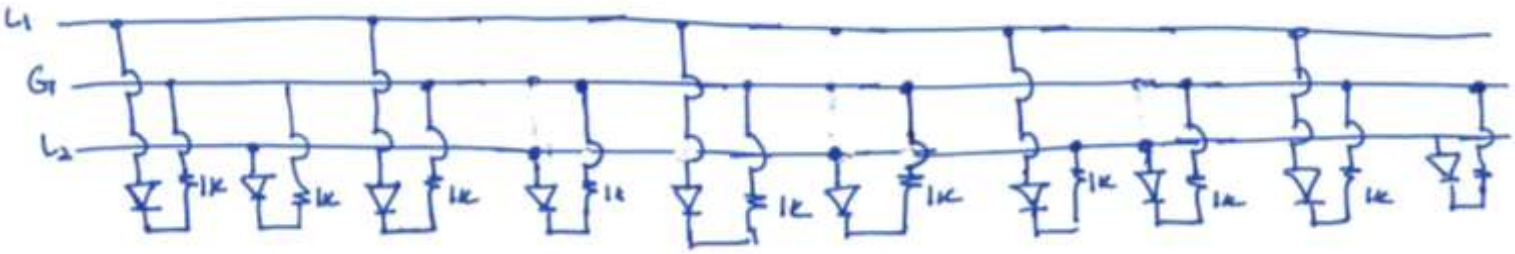
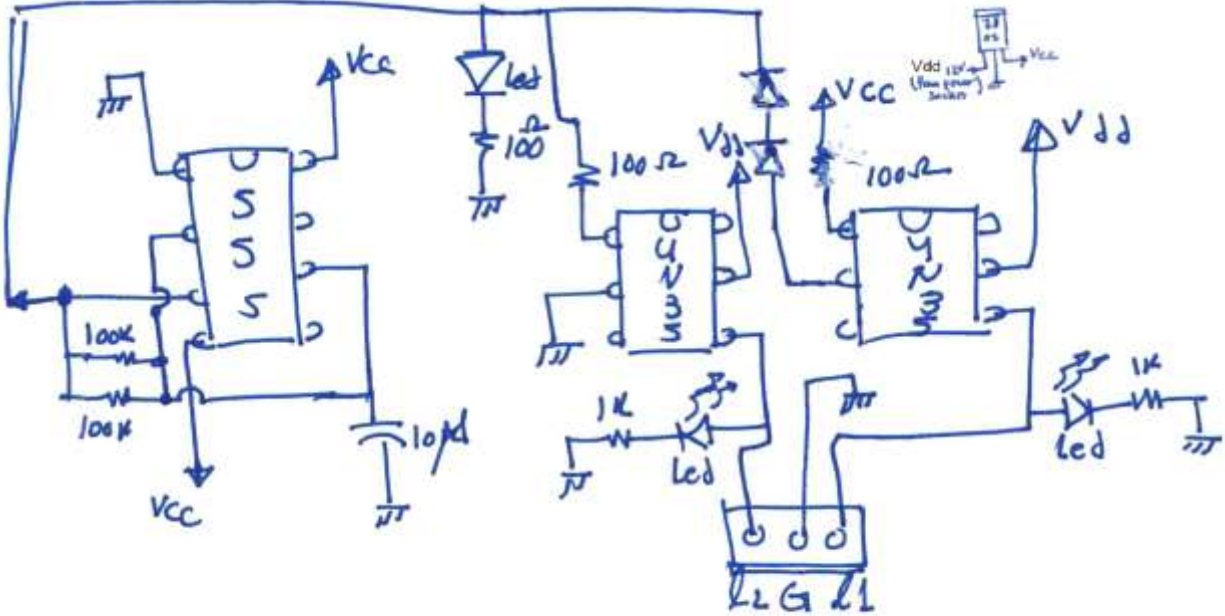
The output stages of nearly all digital logic circuits can either sink or source useful amounts of output current for switching and controlling a large range of output interfacing devices to control the real world. When we talk about sinking and sourcing currents, the output interface can both “give out” (source) a switching current or “absorb” (sink) a switching current. Which means that depending upon how the load is connected to the output interface, a HIGH or LOW output will activate it.

Opto-isolator

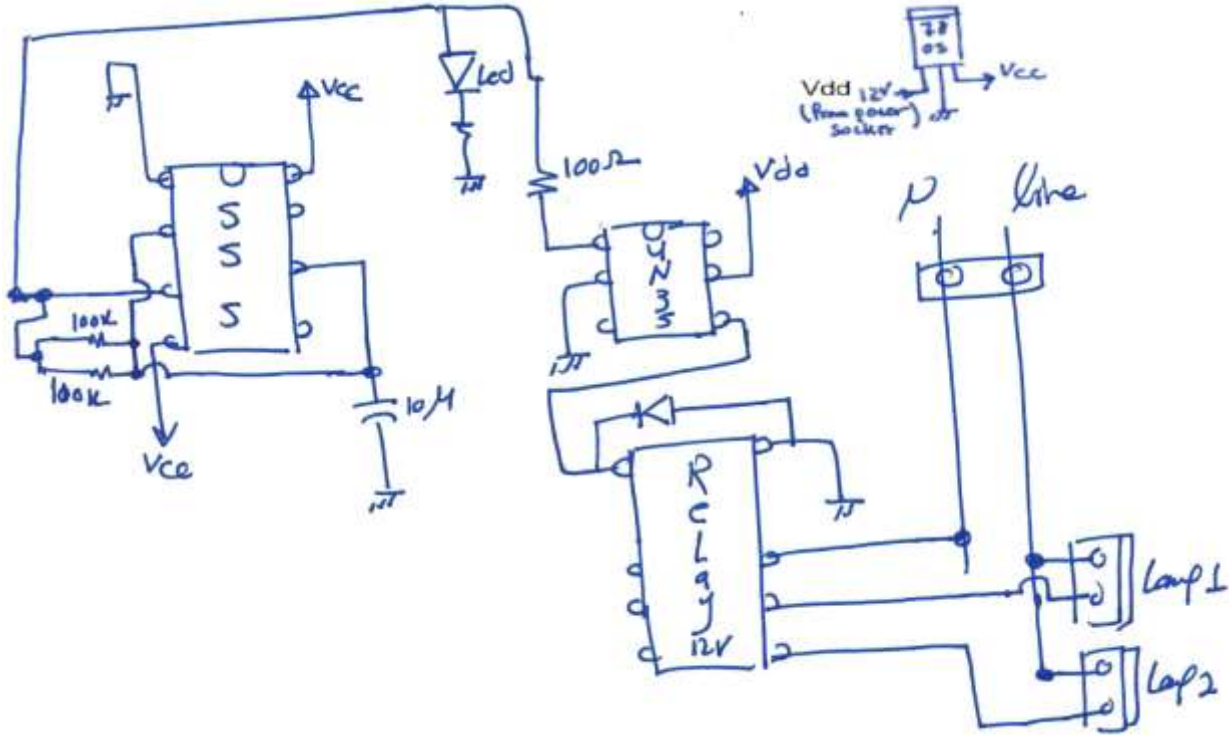


As the input is an LED, the value of the series resistor,  $R_S$  required to limit the LED current can be calculated the same as above. The LEDs of two or more opto-isolators can also be connected together in series to control multiple output devices at the same time.

## Part1: interfacing a higher DC voltage/current loads to 555 Schematic



## Part2: interfacing AC loads to 555 Schematic



## Components list

#	item	link	Quantity
1	DC Power 2.1mm Connector on PCB	<a href="http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=1203">http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=1203</a>	2
2	Wall Adapter Fixed 12Vdc (1A)	<a href="http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=1394">http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=1394</a>	1
3	L7805CV "Positive Voltage Regulator 5V"	<a href="http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=635">http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=635</a>	2
4	4N35	<a href="http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=465">http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=465</a>	3
5	NE555	<a href="http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=609">http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=609</a>	2
6	Relay 12 V	<a href="http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=940">http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=940</a>	2
7	Terminal block 2	<a href="http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=752">http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=752</a>	3
8	Terminal block 3	<a href="http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=753">http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=753</a>	1
9	Cap 10 u	<a href="http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=488">http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=488</a>	10
10	Resistor 100 ohm	<a href="http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=313">http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=313</a>	10
11	Resistor 100 K	<a href="http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=383">http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=383</a>	10
12	Led 5mm	<a href="http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=383">http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=383</a>	15



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13	Diode	<a href="http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=904">http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=904</a>	5
14	PCB 15x9 cm2 (PCB4) - Bread Board Shape	<a href="http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=2732">http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=2732</a>	2
15	Twisted pair wires (1 pair telephone or 4 pairs networks cable)	-	-



كلية الهندسة

*Faculty of Engineering*



جامعة أهرام كندا  
AHRAM CANADIAN UNIVERSITY