A.1.3 Learning activity

Objective

Elaborate an investigation and presentation to be exposed during class on the topic of sensors.

Development

1. Make use of the following list of sensors for the development of the activity:
   - [ ] 1.1 Infrared encoder sensor
     FC-03
   - [ ] 1.2 Presense pair emitor/receptor sensor
     QRD1114
   - [ ] 1.3 Ultrasonic presense detector sensor
     HC-SR04
   - [ ] 1.4 Temperature and humidity sensor
     DHT11
   - [ ] 1.5 Temperature and humidity sensor
     DHT12
   - [x] 1.6 RGB color sensor TCS34725
   - [ ] 1.7 Infrared Remote Control sensor
     AX-1838HS
   - [ ] 1.8 Infrared Reflective Sensor
     TCRT5000
   - [ ] 1.9 Movement sensorPIR
     HC-SR501
   - [ ] 1.10 Optic distance sensor Sharp
     2Y0A02/GP2Y0A02YK0F
2. Redact on this document the following points.

Career : systems engineering

Professor : Jaime Leonardo Enriquez Alvarez

Assignment : RGB color sensor TCS34725

Date : April 12th 2021

Team : Los Grumosos

Students:

No.	Name	Control No.
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Introduction

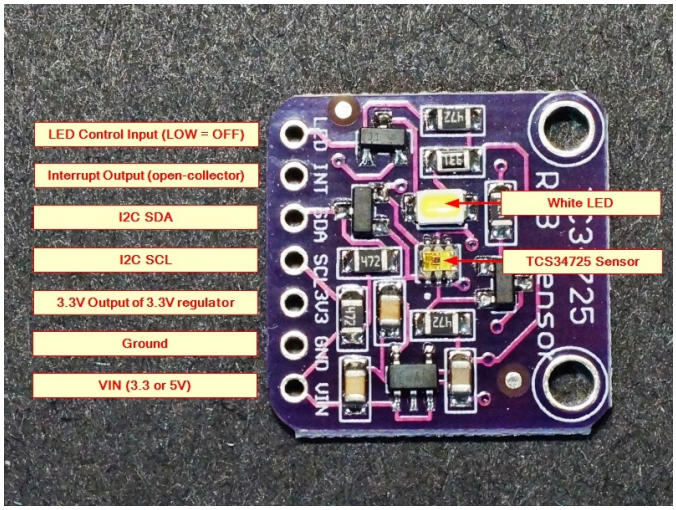
Throughout this documentation we will explain the operation of the RGB color sensor TCS34725, as well as its physical and electrical characteristics, among other aspects in order to correctly understand the handling of this sensor.
The RGB color recognition sensor module TCS34725 is one of the best recognition sensors on the market for Arduino or Raspberry Pi.
TCS34725 it has elements to measure RGB and white light. It has an integrated IR blocking filter, which minimizes the IR spectrum, achieving very precise color measurements. This makes the readings correspond to "true" or visible color since humans do not see the IR spectrum.

Definition

The TCS34725 device provides a digital return of red, green, blue (RGB), and clear light sensing values, It has integrated infrared blocking filter, which minimizes the infrared spectrum achieving very precise color measurements, provide an ideal color sensor solution for use under varying lighting conditions and through attenuating materials.

The TCS3472, itself, can enter a lower-power wait state between light sensing measurements to further reduce the average power consumption.

Picture of the sensor



Physical characteristics

- Base device: TCS34725
- Weight: 3.23 gr
- Dimensions: 2cm X 2cm
- SDA: Serial Data
- SCL: Serial Clock
- INT: interruption in case the light level is out of range, generates an interruption and is active until restarted with the microcontroller.
- LED: For activation or deactivation of the same.

Electric characteristics

- Input voltage: 3 Vdc - 5Vdc
  NOTE: You can occupy either the 3v3 Pin to power or the default Vin pin which is at 5 Vdc, but only one must be connected.
- Input current: up to 20mA
- Power: 60mA - 100mA

Behavior in the environment

Optical Characteristics, VDD = 3 V, TA = 25C, AGAIN = 16, ATIME = 0xF6 (unless otherwise noted)

PARAMETER	TEST CONDITIONS	Red Channel			Green Channel			Blue Channel			Clear Channel			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	
R_e Irradiance responsivity	λ_D = 465 nm Note 2	0%		15%	10%		42%	65%		88%	11.0	13.8	16.6	counts/ µW/ cm^2
	λ_D = 525 nm Note 3	4%		25%	60%		85%	10%		45%	13.2	16.6	20.0	
	λ_D = 615 nm Note 4	80%		110%	0%		14%	5%		24%	15.6	19.5	23.4	

NOTES:

1. The percentage shown represents the ratio of the respective red, green, or blue channel value to the clear channel value.
2. The 465 nm input irradiance is supplied by an InGaN light-emitting diode with the following characteristics: dominant wavelength λD = 465 nm, spectral halfwidth Δλ½ = 22 nm.
3. The 525 nm input irradiance is supplied by an InGaN light-emitting diode with the following characteristics: dominant wavelength λD = 525 nm, spectral halfwidth Δλ½ = 35 nm.
4. The 615 nm input irradiance is supplied by a AlInGaP light-emitting diode with the following characteristics: dominant wavelength λD = 615 nm, spectral halfwidth Δλ½ = 15 nm.

Applications

The TCS3472 color sensor has a wide range of applications including RGB LED backlight control, solid-state lighting, health/fitness products, industrial process controls and medical diagnostic equipment.
Ambient light sensing is widely used in display-based products such as cell phones, notebooks, and TVs to sense the lighting environment and enable automatic display brightness for optimal viewing and power savings.
Other generic applications include:

- RGB LED Backlight Control
- Light Color Temperature Measurement
- Ambient Light Sensing for Display
- Backlight Control
- Fluid and Gas Analysis
- Product Color Verification and Sorting

Los grumosos 🐻 Conclusions.

Nava Reyes Carlos

With the research we achieved a great understanding of how the TCS34725 sensor works because it is one of the mos

Olivas Calderon Cinthia Guadalupe

Analyzing the information collected about the TCS34725 RGB color sensor, we can highlight the way the sensor recc

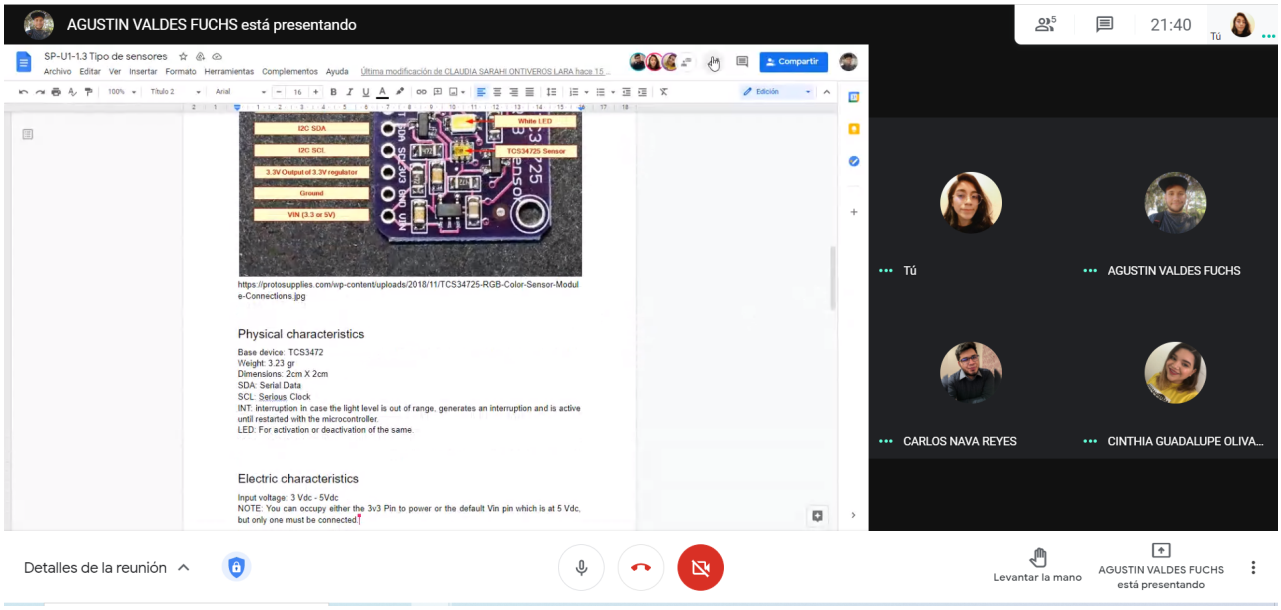
Ontiveros Lara Claudia Sarahi

After researching the RGB color sensor TCS34725 I could better understand some important and basic points about t

Valdés Fuchs Agustín

With this practice I was able to understand the functions available when using a TCS3472 RGB color sensor, as it
The teamwork was made easy by using meet to hold videocalls, VSCode with liveshare to work alongside our teammate

1. Insert picture **evidence** such as the team meetings made for the development of the activity.



Github links

- Carlos Nava
- Cinthia Olivas
- :octocat: Claudia Ontiveros
- Agustin Valdes