TCS3200 working

Light Detection:

- The TCS3200 has an array of photodiodes that sense light in the visible spectrum (red, green, and blue).
- Each photodiode is filtered to respond only to specific colors (red, green, or blue) or remains unfiltered (clear).

Color Filters:

- The sensor uses an array of 8x8 photodiodes with:
    - **16 red filters**
    - **16 green filters**
    - **16 blue filters**
    - **16 clear (no filter) photodiodes**
- By selecting specific filters, the sensor measures the intensity of each colour component in the incident light.

Frequency Output:

- The TCS3200 converts light intensity to frequency:
    - Higher light intensity → Higher frequency
    - Lower light intensity → Lower frequency
- The output frequency is proportional to the intensity of the selected colour.

S0	S1	OUTPUT FREQUENCY SCALING (f_o)
L	L	Power down
L	H	2%
H	L	20%
H	H	100%

S2	S3	PHOTODIODE TYPE
L	L	RED
L	H	BLUE
H	L	Clear (no filter)
H	H	GREEN

Applications:

- RGB color detection.
- Sorting objects based on color.
- Ambient light sensing in automation.
- Color-based robotics and interactive projects.