ELP101

PROJECT -7

BATTERY LEVEL INDICATOR

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(Table no. 4)

Contents:

1.Aim: To make a battery level indicator using integrated circuit.

2.Abstract:

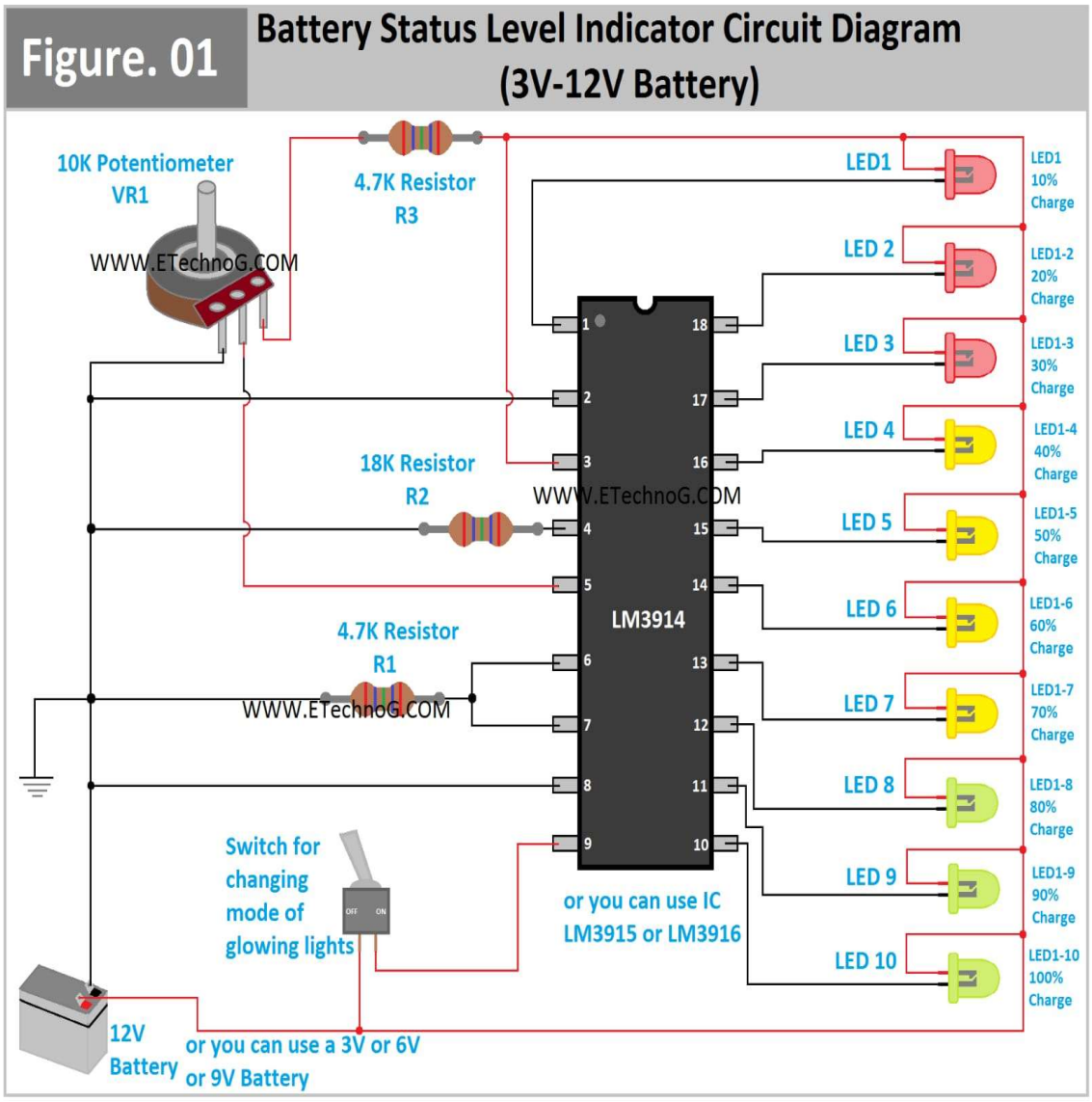
A battery level indicator circuit uses LEDs and an LCD to show the status of a device's battery. The circuit can indicate the battery's voltage and power quantity, and the number and color of glowing LEDs indicate the battery level.

3.Apparatus:

1. LM3914 IC
2. LEDs-10
3. DC Source
4. Potentiometer-10kΩ
5. Resistors (18kΩ ,4.7kΩ and 56kΩ)
6. Connecting wires

4.**Circuit Diagram:**

Fig: Schematic circuit diagram for battery level indicator



6.Theory:

1.Functionality of LM3914 IC:

- The LM3914 is an integrated circuit used to operate displays that visually show the magnitude of an analog signal. It drives 10 LEDs, providing a linear analog display. Half of the pins of this IC can be in charge of driving LEDs, and the remaining pins are used for controlling the IC, reference voltages and power.
- Pin1: (LED1, LED2, LED3,..LED10): The LED which has to be operated is allied to these pins.
- Pin2: Used to connect to lower supply voltage(negative terminal).
- Pin3: Used to connect to higher supply voltage (positive terminal).
- Pin4: Used for setting lower threshold voltage level.
- Pin5: Used to set input supply voltage for indication at output
- Pin6: Used for setting higher threshold voltage level.
- Pin7: Reference voltage of Output for limiting the LED current
- Pin8: Used for setting of voltage reference.
- Pin9: Used to set mode of indication.

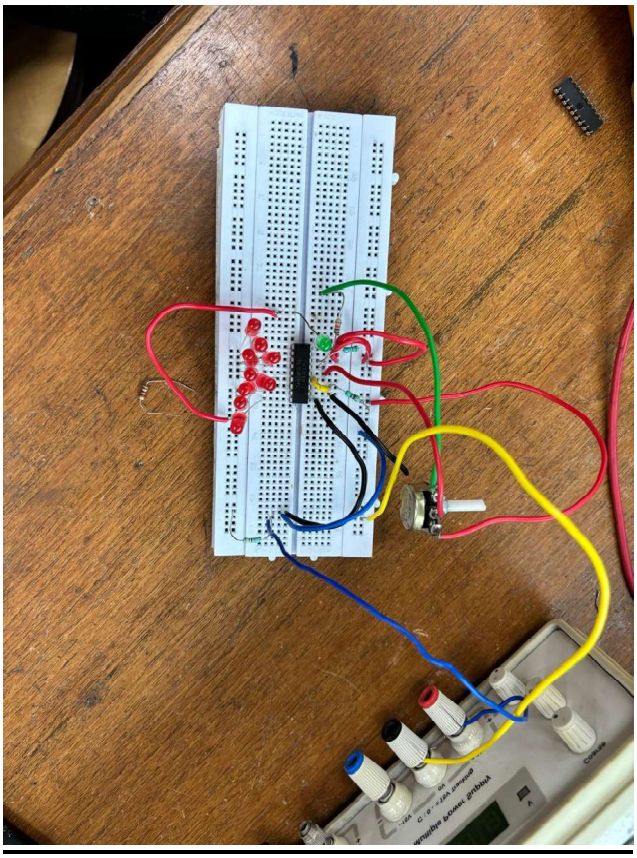
2. Potentiometer:

It basically acts as a voltage divider, and thus we can use our circuit to work at different voltages and also vary the gap of voltages between the glowing of two LEDs.

3. Resistors:

Resistors are used to divide the input voltage and provide the voltage accordingly as needed by each pin.

Breadboard Setup:

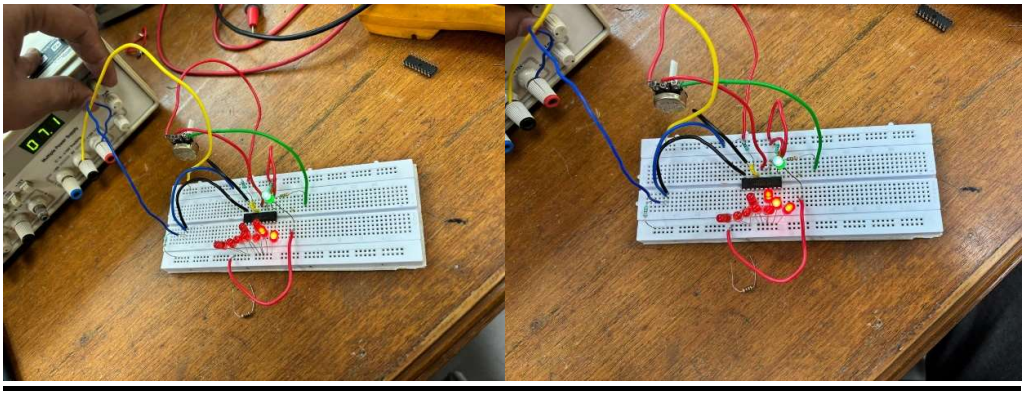


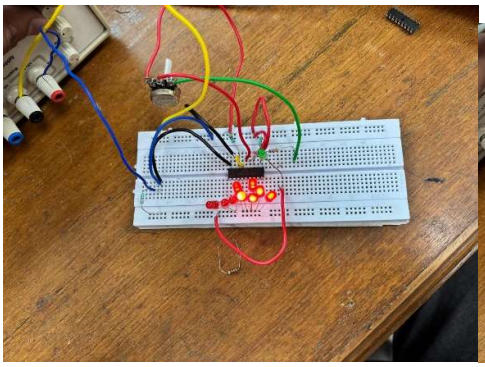
7.Readings:

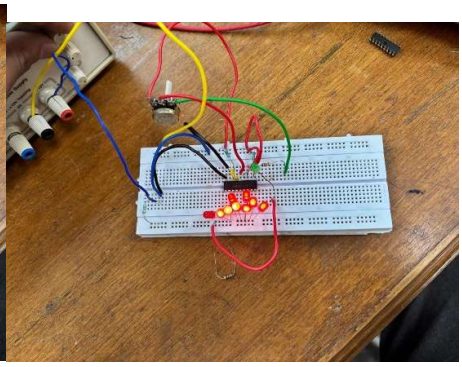
Table-1: Table for voltages at where LEDs light up

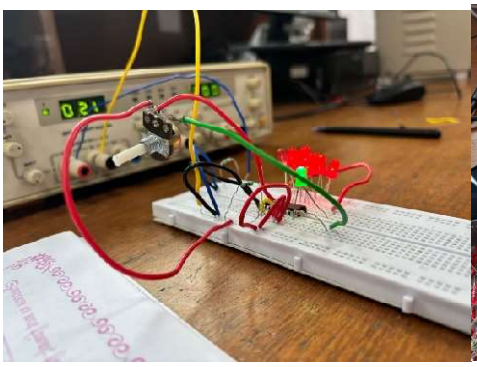
No. of LEDs light up	Voltages at which LEDs light up (Volts)
1	7.2
2	8.1
3	8.5
4	9.0
5	9.4
6	9.8
7	10.2
8	10.9
9	11.3

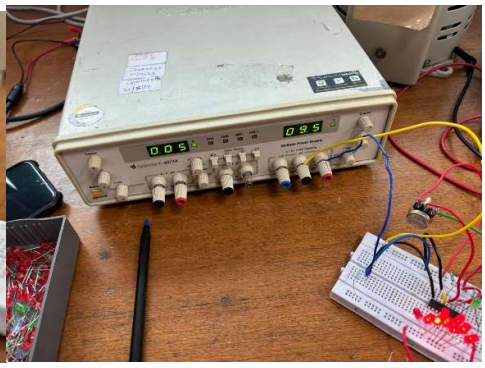
Observations:

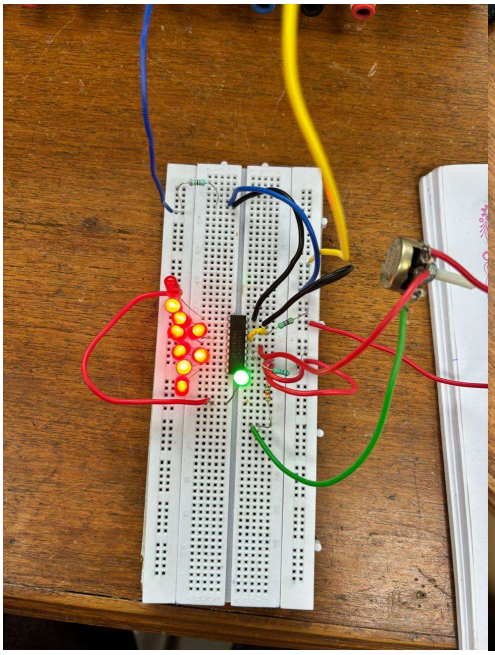


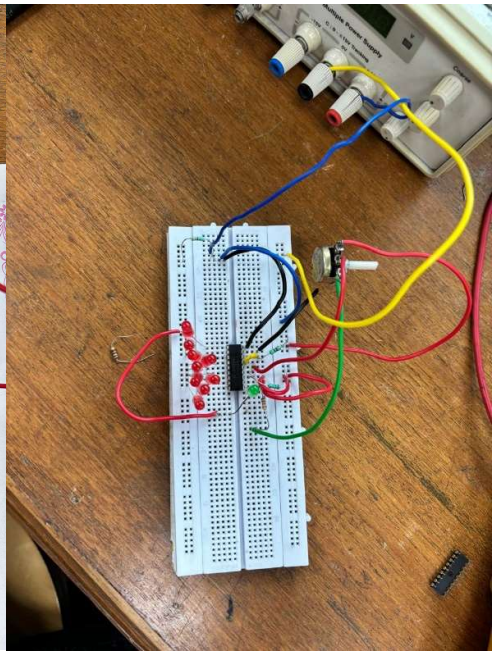












8.Conclusion:

This simple circuit effectively uses the LM3914 to monitor the battery voltage and display the level using a 10-segment LED bar. By adjusting the reference voltage and using appropriate current-limiting resistors for the LEDs, you can create a functional and clear battery level indicator for a variety of battery-powered applications.

9.Applications:

- Cordless tools: Battery level indicators are similar to a car's fuel gauge, and can help you prepare when the battery is running low.
- Mobile phones: Battery level indicators are usually shown as a bar or dots on the screen.
- Inverter or car battery: A battery level indicator circuit can be used to show the battery status of a car battery or inverter.
- Battery electric vehicles: Battery level indicators are especially important in battery electric vehicles.

10.Appendix-1:

Fig: datasheet of LM3914 IC