# Battery Monitoring Device

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## Objective:

The objective of this project is to monitor the charge of a battery. We can easily change division of monitoring and range.

## Equipment:
1. LM3914-N IC
2. 100k & 50 k pot
3. Resistor- 100k, 5.1k
4. Capacitor 4700uF
5. 10 LED lights
6. Bread board
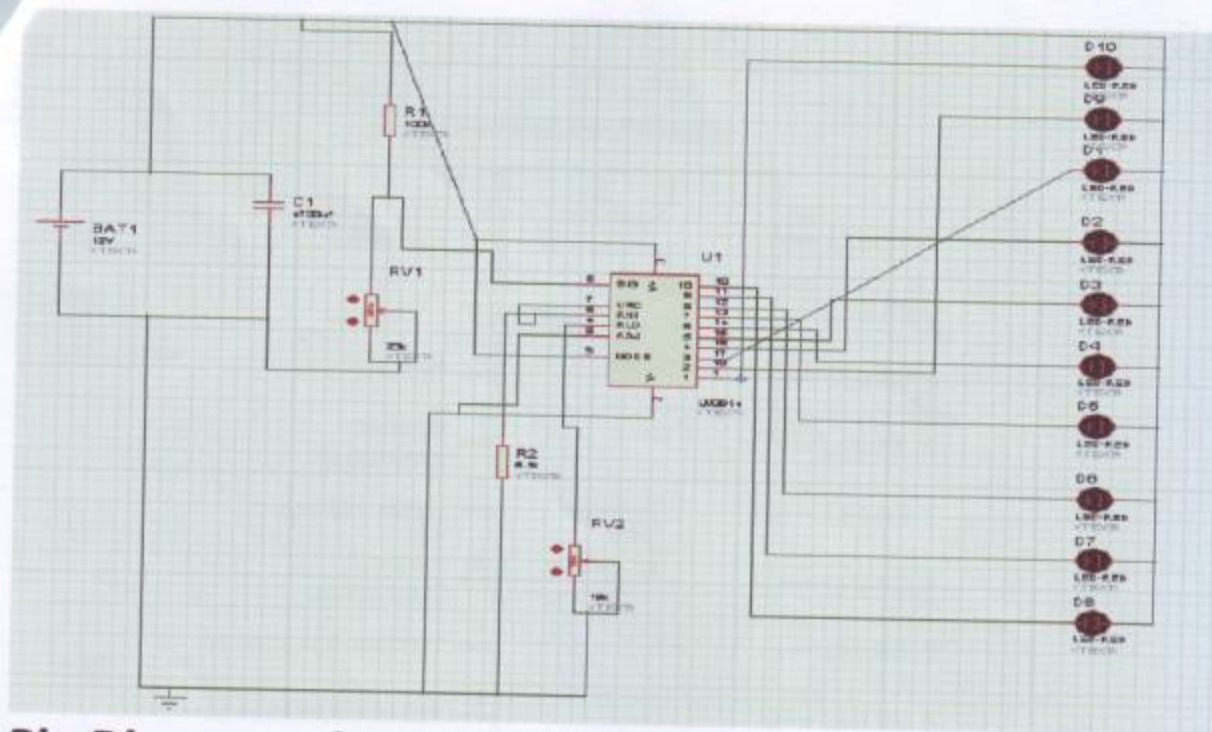7. Wire
8. Variable DC supply

## Features of LM 3914:

1. Drives LEDs, LCDs or vacuum fluorescents

2. Bar or dot display mode externally selectable by user
3. Expandable to displays of 100 steps
4. Internal voltage reference from 1.2V to 12V
5. Operates with single supply of less than 3V
6. Inputs operate down to ground
7. Output current programmable from 2 mA to 30 mA
8. No multiplex switching or interaction between outputs
9. Input withstands ±35V without damage or false outputs
10. LED driver outputs are current regulated, open-collectors
11. Outputs can interface with TTL or CMOS logic
12. The internal 10-step divider is floating and can be referenced to a wide range of voltages


## Circuit Diagram (by Proteus):

## Pin Diagram of LM3914-N:

**Dual-in-Line Package**

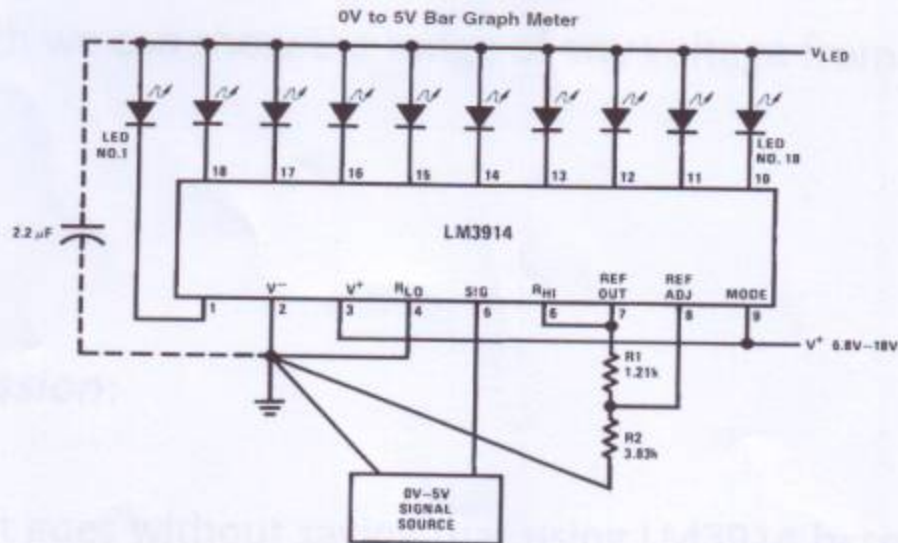| | | |
|---|---|---|
| LED NO. 1 — | 1 | 18 — LED NO. 2 |
| V⁻ — | 2 | 17 — LED NO. 3 |
| V⁺ — | 3 | 16 — LED NO. 4 |
| DIVIDER (LOW END) — | 4 | 15 — LED NO. 5 |
| SIGNAL INPUT — | 5 | 14 — LED NO. 6 |
| DIVIDER (HIGH END) — | 6 | 13 — LED NO. 7 |
| REFERENCE OUTPUT — | 7 | 12 — LED NO. 8 |
| REFERENCE ADJUST — | 8 | 11 — LED NO. 9 |
| MODE SELECT — | 9 | 10 — LED NO. 10 |

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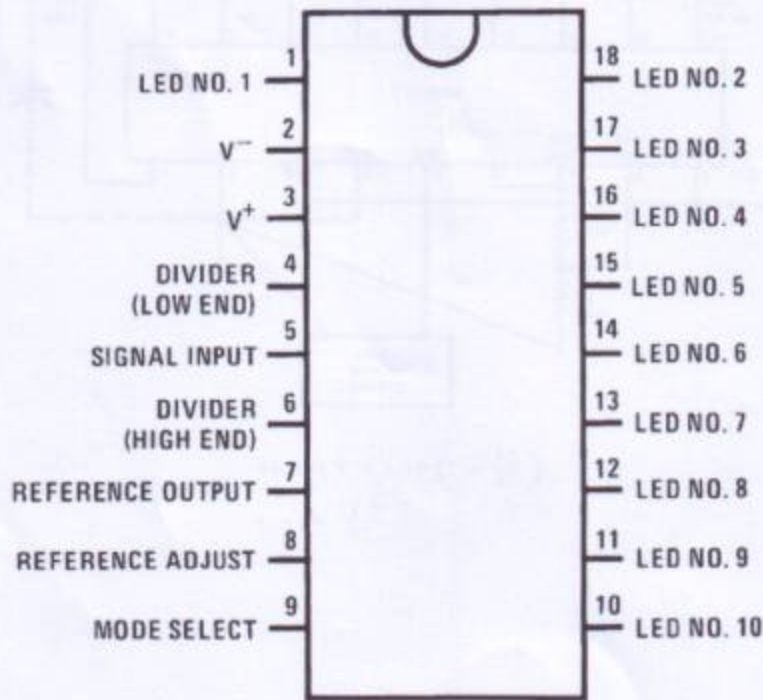
**Top View**

**Working Principles**

Here we use two pots. We used one pot to vary the voltage division and we used the other pot to vary the range of voltage.

## __Basic Bar Graph Meter :__

We used the pin 4 for varying the division of voltages. This pin is connected to pin 5 to control the range of voltages. We used pin 2 for grounding. We used the 9v to 12v IC for example.

0V to 5V Bar Graph Meter

$$\text{Ref Out } V = 1.25 \left(1 + \frac{R2}{R1}\right)$$

$$I_{LED} \cong \frac{12.5}{R1}$$

## **Working Principle:**

Here we use two pots. We used one pot to vary the voltage division and we used the other pot to vary the range of voltage.

We used the pot connected to the pin 4 for varying the division of voltages. The pot connected to pin 5 to control the range of voltage. We used pin 2 for grounding. We used the 8v to 12v as for example.

Though we can show the range of any voltage from 4 to 22v.

## Discussion:

Now, it goes without saying that using LM3914 based our device can monitor a battery very smoothly. We can observe the charge level of any kind of dc battery. This device is very essential for observe the level of charge of DC source.