

Electronics Q&A

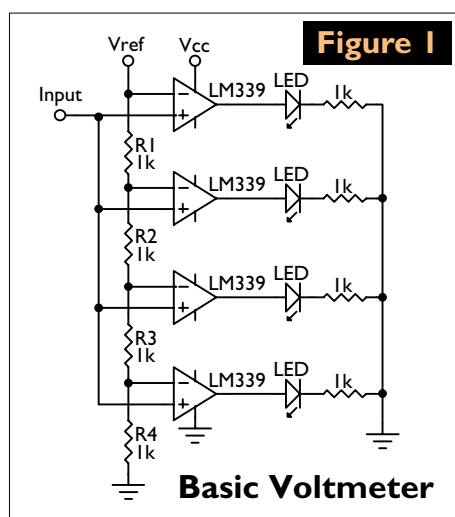
In this column, I answer questions about all aspects of electronics, including computer hardware, software, circuits, electronic theory, troubleshooting, and anything else of interest to the hobbyist.

Feel free to participate with your questions, as well as comments and suggestions.

You can reach me at:
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What's Up:

Test instruments galore, that's what. A handful of voltmeters, a diode, electrolytic capacitor ESR, and novel continuity tester. Finally, a reader takes up a Q&A design challenge and earns a year's subscription to *Nuts & Volts*.

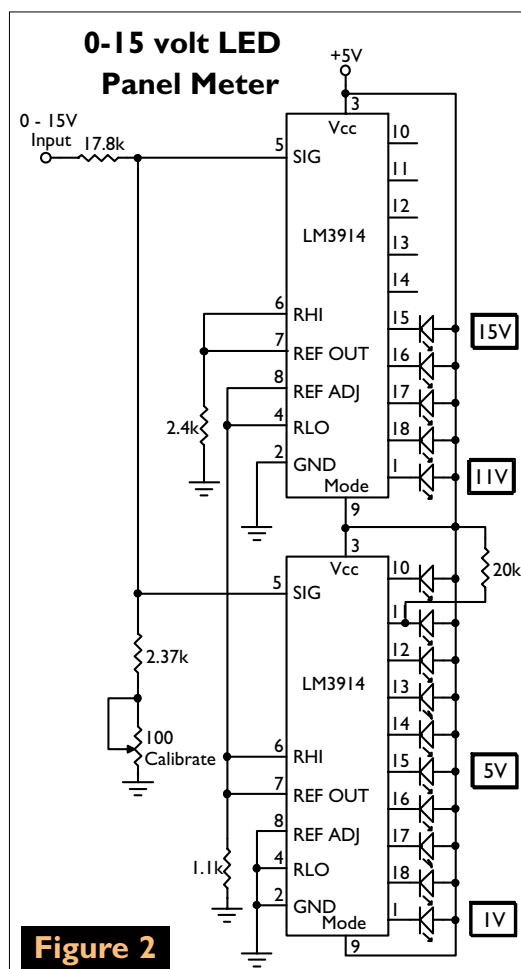


LED Voltmeter

Q. I'm interested in building a voltmeter that shows the voltage level using a row of LEDs in a bargraph. I plan on using this for a panel meter, so I only need one range of 0-15 V and I want to use 15 LEDs for the display. Do you have a schematic for this device?

Nicholas Olcan
via Internet

A. This is easily done using comparators; the basic circuit is shown in Figure 1. Each comparator is biased one step higher than the comparator under it. As the input voltage increases and exceeds the reference voltage on the comparator's inverting input, the output goes high and lights its respective LED. However, your request would require four of these chips plus 30 resistors. A better solution is the LM3914 Dot/Bar Display Driver. This IC contains 10 comparators with LED drivers, a buffer input op-amp, and a 1.2-volt reference. Only two ICs and four resistors are required to make a bargraph voltmeter that measures zero to 20 volts (Figure 2). Per your request, only 15 LEDs are shown, but it's easy enough to add the remaining five. The 100Ω pot is used to calibrate the voltmeter. If you don't have a suitable voltage reference for calibration, setting the pot to mid-range should provide 1% accuracy.



Name this Object

Q. I wonder if you can answer a very puzzling question.

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