LED VU-Meter 60dB Reloaded 2014

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Original 1st version published in Elektor Electronics 7/8 2002 with title »60-dB LED VU-Meter « by the same author

Photo by Rikard © 2014

Introduction

Originally, first version of this VU-Meter, was published in Elektor Electronics 7/8 ©2002 with title »60dB LED VU-Meter« by the same author. New advanced version published here is a significant modification of the original circuit with several improvements listed below. These are based primarly on lower power supply voltage, which is now, very popular and very commonly available, the +5Vdc.

Core

Shematic diagram of the new VU-meter in Figure 1. shows modifications clearly colored in red, so they can be easily distingushed and compared with the original, version-one diagram.

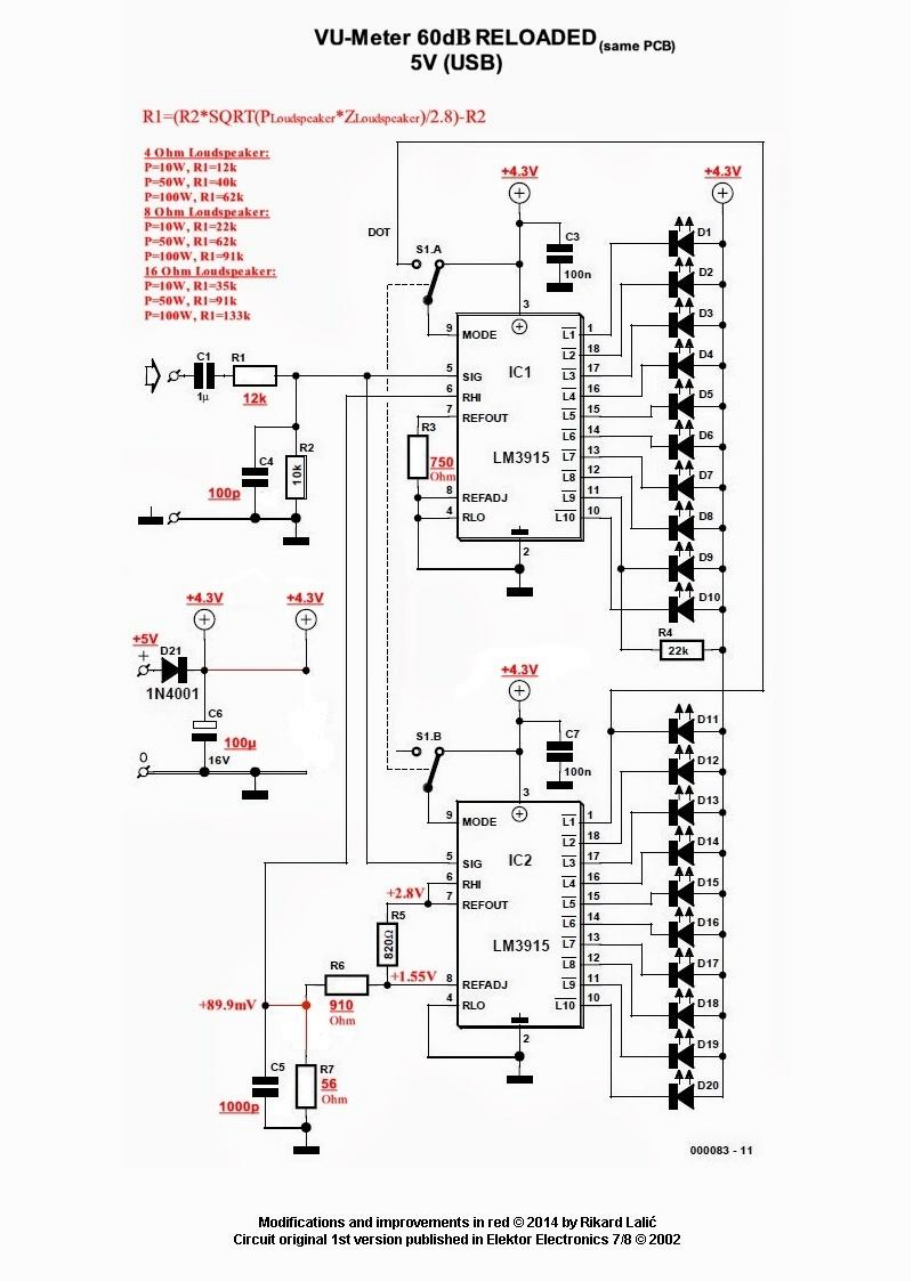

Figure 1. LED VU-Meter 60dB Reloaded 2014

Following advantages benefit this new circuit:

- simplifyed and compatible with original version

- LM3915 pin 5 input level decreased from 5V to 2.8V, meaning generic senitivity increased by roughly 5dB. In order to remain compatible with 1st version, R1 has been modified and can be picked up from the table or calculated for specific needs from the formulae.

- fully functionaly operates from barely +5Vdc power supply and covers the whole 60dB of the very same input signal range as in previous version (within few percents). Stabilised power supply is adviced.

- retains same brightness, no LED current droop-out even with such a low power supply voltage has been evident. That assuming any ordinary or other LED is applied with forward votage of about 2V or so. Most Red, Green and Yellow ordinary LEDs or LED Displays fullfill this condition.

- in DOT MODE, which in this circuit behaves as VIRTUAL SMEAR-BAR MODE (AC audio signal), circuit consumes far bellow 500mA (Stereo-Tandem or Single-Mono configuration), 50mA typicaly. That is what at least any typical PC USB 2.0 or later USB computer interface is nominaly capable of to deliver. In BAR MODE and in Stereo-Tandem configuration, the peak current consumption can be significantly above 500mA, some 750mA is typical value with all LEDs »ON«. Using personal computer USB 2.0 socket is therefore, in this second case disadviced. Most of the commertialy and broadly available, very popular, Wall-Mains-Outlet USB AC/DC Adapters can deliver 1A or more current, what is more than enough for full stereo version of this VU-Meter. It should be noted, that average current is still only half of the peak one, so on average scale, this circuit current will allways stay well below 400mA.

- can retain the very same Elektor PCB (000083) with no modifications to the PCB itself

- reatins design simplicity and precision of the pure audio input signal authentical processing

- requires less components, resulting in lower costs

- requires no more alignment, uses fixed value components, what makes it easier to build and instantly use. The 1% tolerance components are adviced for critical resistor positions.

- dissipates less heat - consumes less power, almost half less (about 45% savings), compared with the previous version

- despite of low supply voltage, retains "Power Polarity Protection Diode" (D21) with known important advantages

- requires only few modicifations / replacements, so even an already built version-one circuit could be efficiently and successfully converted into the new one.

Conclusion

This circuit update may be interesting for many as there have been evident attempts worldwide to build and use version-one circuit even today. It seems cirucit retains or even regains popularity. Avaibility, polpularity and importance of energy savings, as well as UBS standard devices and power

supplies operating from +5V, have reached an imperative presence in society today. Attempts to make use of +5V power supply with unmodified or partialy and unsufficiently modified original VU-Meter circuit version-one, results in incorrect operation (out of LM3915 suggested specifications), so adequate circuit, referencing old article, is described in this short article to cope with that. The described circuit has been built and fully and successfully tested.

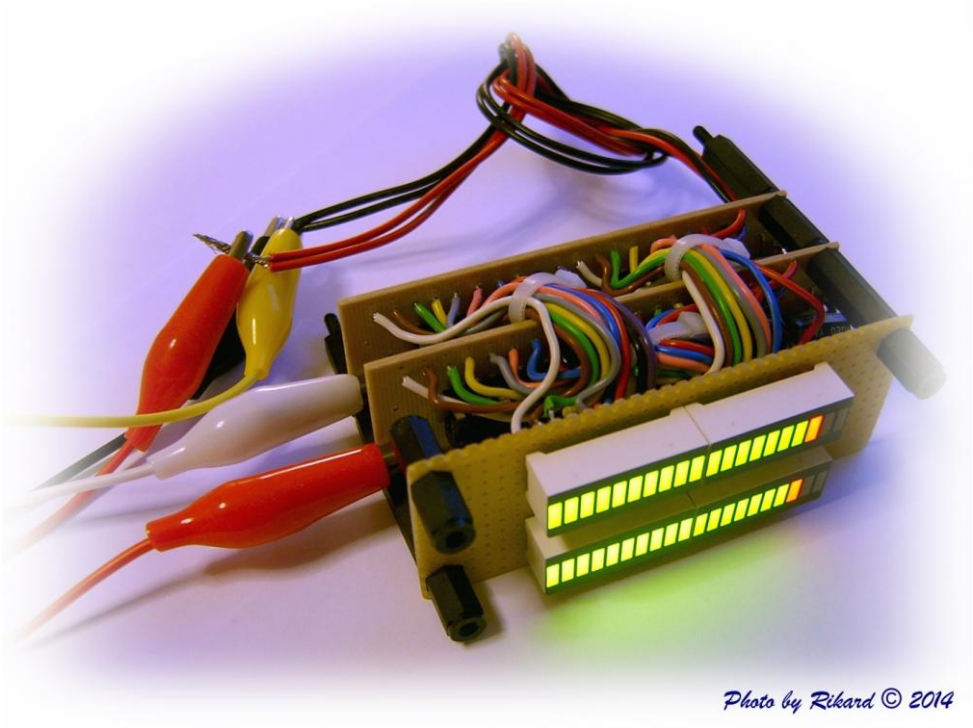

Figure 2.

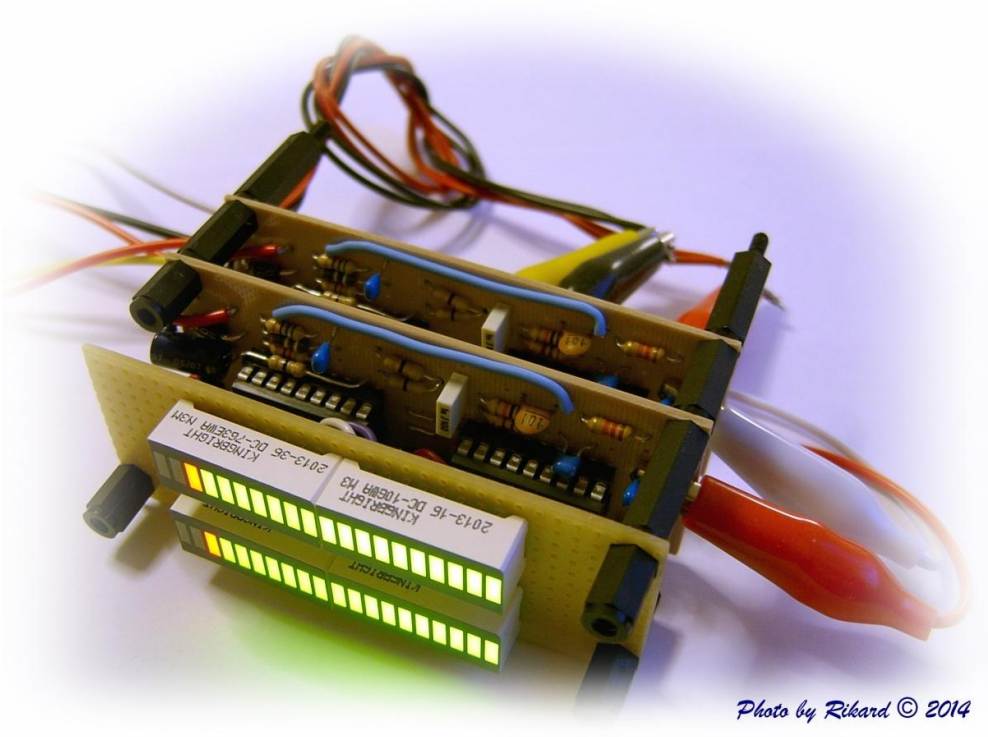

Figure 3.

Licence information

The »60dB LED VU Meter« original shematic diagram is

All other shematic diagrams, photos, text and documents included in this project documentation are