

Re: Digital meter feedback?

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- *From:* "Chris" <cfoley1064@xxxxxxxxxx>
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Ken C wrote:

I bought a Chinese digital ammeter on eBay like this one:

<http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=7592942796&sspagename=ADME:B:AAQ:US:1>

It requires a 5VDC power supply. The vendor initially suggested you could pull the power from the leads the ammeter was monitoring:

<http://www.lightobject.com/support/PMeter.htm>

I am using the meter with a 13.8V system. Without the shunt leads connected, the meter draws 40ma. As soon as the shunt leads are connected (with no actual current imposed on the shunt), the meter current draw went through the roof. Fortunately, I was testing with a current-limited lab supply.

The vendor then said that his drawing was wrong and that the shunt had to be grounded if the monitored lead was used to power the meter. Obviously, an ammeter that must ground its shunt is of limited utility.

Moreover, the method did not work. The meter showed "-00.4" when repositioned on a lead to ground when the load was open and there was no current.

Finally, I switched to a separate power source --- a 9V battery into a 7805. Now the meter works OK, but runs the battery down in ten hours. I had hoped to put two meters in an enclosure, which means a too-short five-hour run time.

Apparently, there is an unnecessary and undesirable connection between the power side of the meter and the sensing side.

Is there any way to isolate the 7805 circuit and still use one of the 13.8V leads?

Ken C

Re: Digital meter feedback?

Your vendor is deserving of negative feedback if he told you a 7107-based Digital Panel Meter (DPM) can handle what's called "high-side measurements". He didn't know what he was talking about.

Actually, it's only because of your caution and using a current-limited supply that your DPM is even working.

Now, there are two ways to do this. First, you can use an isolated DC-to_DC converter which will work over the automotive voltage range (11V to 16V, with load dump protection) for each DPM (you can double up if both shunts have the battery voltage as a common, but you may have to disable the negative segment of the first LED — they'll both read negative amps).

The second involves some cobbling. You can use an op amp configured as a diff amp, along with some precision resistors (and probably a tweaker pot to offset null) to do the level translation. Also, with a single supply op amp, you may have a bit of trouble getting down to below 100uV (one count of your DPM is 100uV). From your prior post, this sounds like it might be a little too much, but it's your call. If you're interested, and are willing to cobble together an op amp circuit to help, post back.

Of course, you could still go retro, and use your 1 milliohm shunts with a couple of 0–50 amp analog panel meters (All Electronics P/N CAT# PMD–50A, \$12 each in single quantities). Then you don't have to worry about power supplies.

<http://www.allelectronics.com/index.html>

Good luck
Chris

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