Re: Beginner question on resistance

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- *From*: John Popelish <jpopelish@xxxxxxxx>
- *Date*: Thu, 22 Mar 2007 22:08:17 −0400

AB wrote:

> First of all let me once again say thanks for all the good advice I get here. I know a lot of this stuff is so basic for many of you, but for me it gives me just enough info to expand my horizons.
>
> Now I have another question that's been confusing me. I have this wireless alarm panel at home that basically waits for a signal from a small wireless transmitter to let it know if a zone is closed (normal condition) or open (alarm condition). Some of these transmitters have 2 terminals where you can physically wire in a multiple magnetic window contacts (in series)...so therefore you use only 1 transmitter to monitor, say, 3 windows.
>
> Now many that post on alarm forums say to limit the series wired contacts to 3 per transmitter...but other alarm guys say you can add "as many as you want as long as you don't increase the resistance too much". There aren't any hard and fast rules it seems. I'm wondering how you will know how many contacts is too many...when the alarm goes off?? What is "too much"
>
> Basically I was wondering a little about the theory of this. Is there is a way to measure when say 5 contacts is OK...but 6 is too many? False alarms can get very costly with fines and all. I welcome your opinions/advice etc.

The limit depends on how much current the alarm passes through the contacts (and the resistance of their wiring) and at what total voltage drop across that circuit, it decides that some switch is open. For instance, if the switch loop is fed with 10 mA and decides that an open condition is indicated at a voltage drop of 2 volts, then the total resistance of the loop and all the switch contacts must drop less than 2 volts while 10 mA passes through them. The limiting resistance would be 2/.01= 200 ohms. For any reasonable gauge wire, that is a lot of length, but this example is completely hypothetical.

I would want to find out the limiting resistance by test, using a variable resistor in place of the loop, and measuring the resistance that is interpreted as an open, by experiment. Then, I would try not to make any loop that had more than a minor fraction (say, 1/3rd) of that resistance, to allow a little room for the contact resistances to rise with oxidation. It is also a good idea to wire the loop as a flattened one, using a pair of wires that take the same route in both directions, to keep the loop from acting like a magnetic loop antenna

that will cause false alarms any time a thunder storm passes