

Re: PSU/RS485 Problem, cant make my mind up.

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- *From:* Anti-Spam <Anti@xxxxxxxx>
  - *Date:* Fri, 09 Feb 2007 07:37:33 +0100
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On Thu, 08 Feb 2007 16:24:41 -0800, Charlie Edmondson  
<edmondson@xxxxxxxx> wrote:

Anti-Spam wrote:

On Thu, 08 Feb 2007 21:10:03 +0100, Rene Tschaggelar <none@xxxxxxxx>  
wrote:

Anti-Spam wrote:

I am designing a RS485 remote control system, to switch relay outputs on some 32 terminals, over an area of some 250 Metres by 200 Metres. I have got a lot of information from the DCI Bus system from Elektor Magazine (December 2002), the only real difference is I am using a PIC Chip with a USART and Max 487e chips for the RS485 Drivers/Receivers. I was intending to use a 3 wire system with two for the RS485 and one for a common ground via a 100 ohm resistor to each board.

The problem is, how do I power the 32+ terminals. I could if I have to, insist each terminal has a mains power supply available, so power supply for each individual terminal was not a problem. But this would be problematical, it would be easier if only every 6th or so, terminal

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had a power supply, and all the terminals shared their power with adjacent terminals, via a pair of twisted cables I have spare, over from the RS485 system. I would fuse each terminal, so no one terminal could short circuit the whole system Each terminal would be fed from a 1N4001, so that voltage differences in the power supplies did not cause a problem. But what I cannot work out is the grounding. In the DCI bus I mentioned earlier, the Signal grounds were via a 100 Ohm resistor to signal ground. But if I have a common power supply arrangement, then I think I cannot use the 100 Ohm "decoupler". I need any thoughts you have on my proposal, thanking you in anticipation.  
Mark in Spain  
mark@xxxxxxxxxxxxxxxxxxxx (remove the X to reply)

You forgot to tell us what power these terminals would take. 1 Watt, 10 Watt, 100 Watts ? If it was just little one could have an additional wirepair and deliver a couple watts for local DC/DC to setp down again. similar to power over ethernet.

Rene

I need 5v for the logic via a 7805 and I need 8–15V for the relay coils. I was going to use the spare pair of wires (Cat5 cable) with 12V DC. The current requirement for each terminal, should not be more than about 200Ma. I was going to daisy chain all the terminals, and all the power supplies.

Assuming I get the OK with the above idea, I just need clarification on the seperate ground mentioned earlier. If all my terminals are supplied from 12V DC then I have the ground on the power supply, going to each board. Was you suggesting that I have a seperate ground circuit for the RS485, and does that mean the ground on the MAX 487 goes to the power supply ground or the RS485 ground circuit?

Ok, so you have a logic problem. First, those relay coils can be thirsty, so each terminal might need a lot more current to handle them.

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You didn't say how many relays per terminal.

So, typically, you have two jacks on your board, and if using cat-5, you probably just use RJ45s, so your send is on one pair and the receive is on the other pair. If you try to just use a single wire for return, you give up the noise rejection of the twisted pairs. This gives you two 'extra' pairs for power and ground.

I personally would use both pairs, with tip at +12 and ring at ground. This way, the twisted capacitance helps filter the supplies. I would have a two pairs of jumpers on each board to connect to each of the jacks, so you can either connect to the power bus one way, both ways, or neither. By doing this, you have several options: If this board has a power supply, it can send out power to other terminals in either direction, both directions, or neither. If it doesn't have a supply, it can get power from either direction, or pass it on through down the chain. They will also come in real handy in trouble shooting power issues (and they will come up!) without just disconnecting cables.

Charlie

Thanks Charlie, I was going to use only one pair of twisted for the comms (half duplex). I like the idea of links on the PCB to give me different powring options. Yes I can use two pairs for the power.