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Source: IEEE 802.3 Working Group  
Title: Communication to TIA TR-42 regarding IEEE P802.3at Power via the MDI Enhancements

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**COMMUNICATION STATEMENT**

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**Subject: Status of P802.3at**

Dear Colleagues:

IEEE P802.3at plans to increase the amount of power distributed over structured twisted pair cabling. The project is to provide a significant increase in the power at the load compared to the limits specified by P802.3af DTE Power via the MDI (now included within IEEE Std 802.3-2005, clause 33).

The P802.3at Task Force proposes to limit the cabling channel DC loop resistance to 25 Ohms and intends this to apply to existing installations including old Category 5.

The P802.3at Task Force has received two presentations on cable heating:

[http://www.ieee802.org/3/at/public/jul06/delveaux\\_1\\_0706.pdf](http://www.ieee802.org/3/at/public/jul06/delveaux_1_0706.pdf)

[http://www.ieee802.org/3/poep\\_study/public/sep05/stanford\\_2\\_0905.pdf](http://www.ieee802.org/3/poep_study/public/sep05/stanford_2_0905.pdf)

which reflect our concerns about possible limiting factors on the maximum specified load power.

Current P802.3at status:

1. The TF is investigating two pair out of four pair and four pair out of four pair powering.
2. The objective for the project is to deliver at least 30W at the load on two pair although higher load power limits have been proposed.
3. Output at the Power Sourcing Equipment (PSE) is expected to be 50VDC minimum, 57VDC maximum.

The P802.3at TF would appreciate your assistance with the following items which are essential for our progress:

1. The actual channel loop resistance is a topic of debate, and we would appreciate some guidance for Medium Dependent Interface (MDI) to MDI links on what the loop resistance applies to and applicable operating conditions.
2. What is the current carrying capacity when all pairs in a bundle are powered and 50% of the pairs in a bundle are powered?
3. We need to understand if there can be any improvement in conductor to conductor DC unbalance within a pair in any channel.
4. What temperature rise should we expect in installations (including typical and worst case) and could you provide the bundle size and installation environment (conduit, etc) used for these?

The following items are less critical, but for which we also request your comment:

5. Our understanding is that the maximum cable operating temperature is 60C for PVC. Is this a reasonable assumption?
6. Can we assume that we can operate at a mathematical sum of ambient plus cable heating provided the total is equal to or below 60C?
7. Can we receive a specification for channel pair to pair DC unbalance?
8. What differences do you expect between stranded patch cable and solid horizontal cable?
9. Is there anything else that you believe we should be investigating or consider in developing our specifications?

We plan to issue an initial draft of our standard in November 2006 and therefore require high quality approximations to our four essential requests by this time. We plan to finalize the content of our Working Group ballot draft in May of 2007 and will appreciate receiving final answers on all requests by then.

We appreciate your cooperation in our past work and look forward to receiving your answers and advice for this current project.

Regards,

Robert M. Grow, Chair, IEEE 802.3 Working Group