

IEEE 802.3 Ethernet Working Group Liaison Communication

Source: IEEE 802.3 Working Group¹

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From: David Law Chair, IEEE 802.3 Ethernet Working Group
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Subject: Liaison letter to ISO/IEC/JTC1 SC25 WG3 and reply to SC25 N2352

Approval: Agreed to at IEEE 802.3 Plenary meeting, San Antonio, TX, November 6, 2014

Dear Dr Oehler,

The IEEE 802.3 Working Group would like to thank you for your response to our liaison letter sent out of the March 2014 Plenary meeting in Beijing.

At the recent IEEE 802.3 Working Group meeting held in San Antonio, TX, 3rd to 6th November 2014, the IEEE P802.3bt Task Force reviewed your reply and has additional questions and comments. Please find these below.

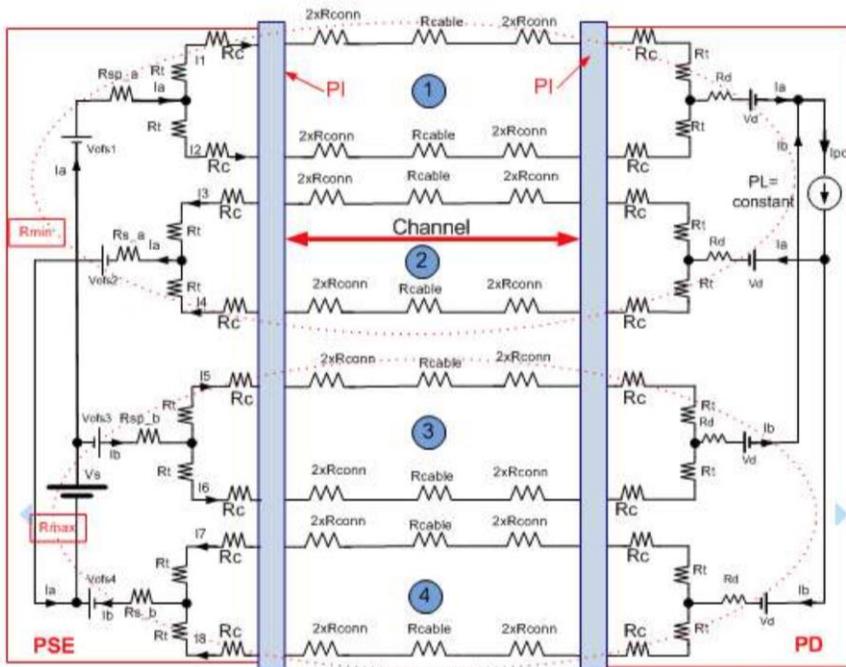
1. We appreciate confirmation that the DC resistance unbalance within a pair is unchanged at 3% or 200 mOhm maximum, whichever is larger.
2. Thank you for considering the elevation effect on installation conditions. We look forward to the results of any testing that is completed.
3. You state that you plan to have a working draft for review by March 2015. When do you expect to have a final draft? We would like to have working figures by June 2015.
4. ISO/IEC 29125 Edition 2 will increase current to 500 mA per conductor. This figure lines

¹ This document solely represents the views of the IEEE 802.3 Working Group, and does not necessarily represent a position of the IEEE, the IEEE Standards Association, or IEEE 802.

up nicely with our stated goal of 100 W PSE power (minus the needed margin) in a theoretical perfectly balanced system.

We have spent significant time looking at system unbalance, which is different than channel unbalance. We estimate that we will have 16% worst case pair-to-pair unbalance in an end-to-end system at 500mA average per conductor, which includes the 7% cabling channel figure you are specifying. This would cause 322mA of current unbalance, driving one pair to 1161mA, or 581mA per conductor, which is above the test target of 500mA. (The other pair of the same polarity will have 419mA per conductor). Is this compatible with the content of ISO/IEC 29125 Edition 2? Our calculations show that the thermal rise of the cable in this system will be less than or equivalent to a perfectly balanced system with 500mA per conductor.

Below, please find a schematic representation of our system model that shows the elements that contribute to the unbalance:



Notes for the general Model:

1. Total end to end channel connectors is 6 max.
2. The formal channel definition is marked in red arrow and is with up to 4 connectors.
3. Our work addresses also the internal application resistance of known components that are used
4. In simulations, pairs 1 and 2 components were set to minimum and pairs 3 and 4 were set to maximum values. See simulation results on previous meetings
5. $V_{ofs1/2/3}$ and 4 was added. To update the group. July 3, 2014.

5. It is mentioned "For existing installations it might be advisable to do an assessment of the installation conditions before applying a 500 mA per conductor." Will ISO/IEC 29125 Edition 2 contain that assessment procedure?

Thank you again for working with IEEE on this important project in support of remote powering applications using balanced twisted pair cabling.

Sincerely,
David Law

Chair, IEEE 802.3 Ethernet Working Group