

Additions to Baseline Proposal for 1000m link specification

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Supporters

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1000m Link proposal

Assumptions discussed in former ad hoc's and interims:

- **Up to 10 connectors**
- **100 ohm nominal impedance (assumption)**
- **1-20 MHz**
- **Cable used to model is deployed widely as Profibus PA; 1.05 mm copper diameter (AWG 18)**
- **Mentioned but not written down**
- **Industrial environment E2 and E3**
- **Non industrial E1 for cabling outside harsh environment**

What do we have

- From January Huntington beach
- Diminico_01_0117 link Baseline accepted proposal (straw poll):
 - Insertion loss (TBD)
 - 10 connectors (TBD)
 - Return loss (TBD)

What is missing

- To start having a baseline channel to be able to calculate Transmission and optional powering parameters the loop resistance should be added to the baseline parameters. Insertion loss is linked in any case to this.
- The assumption for insertion loss and return loss were taken assuming an AWG 18 cable and also the proposal *Jens Gottron, Ludwig Winkel Contribution to CSD and Objectives* assumed this type of cable.

Loop resistance proposal

Schicketanz Fritsche [Update to Proposal for 1000m link specification](#) 12/16 Proposed 45 Ohm

Chris Diminico presented 46.66 in [Link segment DC characteristics](#) 11/16 (not on the server)

Therefore 46.5 Ohm should be used as link baseline proposal

If this value is too high for some specific powering projects AWG 16 or even AWG 14 cables could be used in installations.

Missing aspects: Environment

- In industrial applications heavy shielded cablings are used nowadays. But at the beginning of the run, maybe in the building less disturbances can be expected.
- It is therefore proposed to use the EMC mice specification E1, E2 and E3 (similar to 802.3bp) and specify accordingly at this low frequencies
 - Coupling attenuation definition starts at 30MHz but could be used below
 - Transfer impedance is well specified for industrial cables but not used in Ex specification
 - Unbalance shows low plateaus at this frequencies

PROPOSAL FOR ENVIRONMENTAL SPECIFICATIONS

	Typical environment	Shield		Unbalance
E3	Heavy industry	TBD		TBD
E2	Light industry			
E1	office			

A liaison should be send to TIA and ISO asking for proposals to fill out the table using the proposed frequency range

Other missing link values that could be filled out later

- Propagation delay
- Alien noise:
 - Due to the shield this can be neglected.
 - If unshielded cables are to be used in E1 environment it has to be checked if unbalance specification is sufficient.

End Main Part

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Comments to the last ad Hoc

were there was not sufficient time (1000m link only)

- Temperature range (#6)
 - This should be left to the cabling groups to discuss with the customers.
 - In any case the link performance is valid for all environmental specifications. If 70°C would be a target then not all 1000m can be at that temperature
 - The limits are link limits, if used for cable calculations it should be kept in mind that there are always margins
 - Shielded cables insertion loss increase is 0.2% in dB (for years in ISO/IEC 11801) , not 0.4 %

Comments to the last ad Hoc

were there was not sufficient time (1000m link only)

- Comment by foil
 - # Table wrongly calculated at 3.75 MHz, additionally temperature and worst –case link model therefore wrong

Comments to the last ad Hoc

were there was not sufficient time (1000m link only)

- Comment by foil
 - Starting with #3. Why inventing the wheel again. This was extensively discussed in 802.3bq and is now in an annex but not part of the general specification.
 - All data presented belongs to an installation handbook and outside the scope of 802.3cg.

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Disturbance improvements Foil Nr.18

The most important possibility to improve noise tolerance is missing

Improve shielding

And it comes for free because it will probably just mean a better shielding installation practice

Just a capacitor with probably long leads will not do the job anymore. Please look at ISO/IEC 14763 for more information.

Comments to the last ad Hoc

were there was not sufficient time (1000m link only)

- Comment by foil
 - There is no proposal to do something just good questions on measurement and definitions.
 - I would suggest to take this discussion out or if needed to do as in 802.3bq