Open issues on the 1000m link specification Draft 1.0

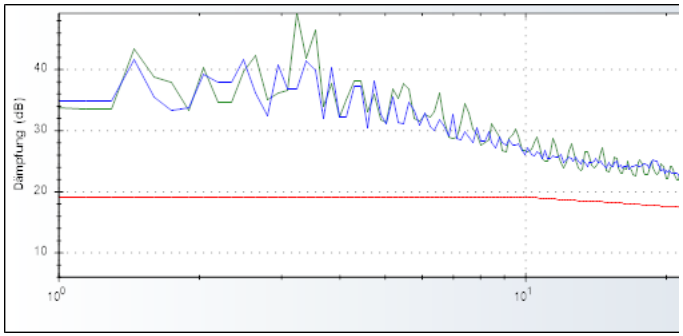
Dieter Schicketanz consultant
Reutlingen University

Return loss 146.7.1.3

Return loss was presented first time mid 2016 by Fritsche Schicketanz and the values at 20 MHz were never looked again.

At the meantime measurements were done and most show that at 20 MHz the limit does not follow measurements (450m AWG18 cable 6m cord).

It is therefore proposed to relax the Rl values at 20 MHz. It would match also most other IEEE links and cabling channels.



Add to equation 146-3

- $10 < f \leq 20$ MHz
- $Rl(f) = 24 - 5\log(f)$

Return loss of installed base cablings

As cables used nowadays in low bitrate industrial communications were usually designed with a resultant impedance much lower than the specification proposed now.

They will fail the return loss requirements.

Additionally due to higher insertion loss they will not meet the IL at 1000m length but some shorter length.

It was discussed with Steffen Graber and it is possible to trade off return loss for insertion loss.

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It was discussed with Steffen Graber and there could be a possibility to trade-off return loss for insertion loss.

It is proposed therefore to add this as a formula (TBD) after 146-7.

Example for one step:

If link insertion loss is lower than 10 dB at 3,75 MHz return loss from 1 MHz to 4 MHz could go down to 12 dB.

Delay 146.7.1.4

- No value proposed in current draft therefore if needed it would be proposed to use:

- **at 3.75 MHz delay less than 5 500 ns**

  This would correspond to a cable of 1000m with an NVP of 0.6. The 10 connectors do not need to be specified separately, because of the long link length.

Electromagnetic classification 146.7.1.5

Table 146-8 only means something if relevant parameters point to it.

ISO/IEC 11801specifies for E_1 to E_3

-TCL and ELTCTL for unshielded links

-coupling attenuation for shielded links

Similar values could be used to specify SPE-L

Electromagnetic classification 146.7.1.5

Shielded channels:

Coupling attenuation

	Frequency	E1	E2	E3	
Coupling attenuation	30 MHz	40	50	60	802.3 bp

CA is not defined below 30 MHz due to measurement definition but it can be assumed that at lower frequencies it will be not lower then the value at 30 MHz.

Wavelenght at 0.1 MHz is 3000m!

Electromagnetic classification 146.7.1.5

Unshielded channels:

TCL and ELTCTL

	Frequency	E1	E2	E3
TCL	.1 to 20 MHz	53-15lg(f)	63-15lg(f)	73-15lg(f)
ELTCTL	.1 to 20 MHz	30-20lg(f)	40-20lg(f)	50-20lg(f)

Alien FEXT 146.7.2.3

- Eq. 146-11 : The limit looks like a PSAACRF limit line .
- Is it really meant to be different to all other IEEE802.3 limits where PSAACRF is specified?

- In any case to specify the cables a reference lenght is needed.
- Proposal to take 100m as in IL and add a sentence accordingly under the equatuion.

Thank you