



# Cabling Developments

New technology impacts cabling market  
for the future

**Bicsi**

# A period is ending

- New edition of ISO/IEC and CENELEC standards are soon published (ISO/IEC 11801-1 / -2 / -3 / -4 / -5 / -6 and EN 50173-1 / -2 / -3 / -4 / -5 / -6)
- New edition of TIA standard is (soon) published
- Include for instance "Category 8" up to 30 m reach
- ISO/IEC and EN standards EXCLUDE Class D / Category 5e for all installations, except industrial (allows Class E / Category 6 in office buildings)

# Basic IEEE Technology Change

- New IEEE developments a few years back
- More information could be sent on cabling, i.e. higher Bit rates (no ACR limitations)
- Two uses of new technology: (1) Higher Bit rates on existing 4-pair cabling and (2) reduction of number of pairs

# Higher Bit rates on existing 4-pair cabling

- Applies for Class D / Category 5e cabling. Now up to 2,5 GBit/s.
- Applies for Class E / Category 6 cabling. Now up to 5,0 GBit/s.
- Up to 20 % of unscreened installations may not run the new applications. Well screened installations have no problems.

# Challenges of new 2,5 GBit/s and 5,0 GBit/s installations

- Noise immunity is the critical factor, i.e. alien crosstalk
- Internally generated noise can to a large extent be cancelled (NEXT, FEXT, return loss)
- Effect of alien crosstalk will be worse for small signal strength, i.e. long channels / high attenuation and bundling

# Availability of new 2,5 GBit/s and 5,0 GBit/s cabling

- No specifications for such cabling exists or are in progress
- Position of standardisation: Only for expansion of data rates for EXISTING installations
- A technical report about implementation of these new cabling speeds in existing installations has been prepared

# Market dilemma

How can you be sure for NEW Class D / Cat. 5e and Class E / Cat. 6 installations that the 2,5 GBit/s and 5,0 GBit/s application can run ??????

(Valid question without present solution for UNSCREENED installations)

# Use of new technology for one pair cabling

- Four pairs not always needed
- Hottest issue in developments: One pair cabling
- NOW: 15 m for automotive and 40 m screened for 1 GBit/s industrial installations (for instance)
- FUTURE: Generic cabling standard for one pair cabling covering lengths up to 1 km (different data speeds)



# Power over Ethernet on one pair cabling

- Power over ethernet (remote powering) is established technology
- Latest developments in progress: Up to 100 Watt support for 4-pair cabling and 50 Watt support for one pair cabling
- Side issue: How to assure PoE+ compliance for cables ????? (not possible today)

# Future of high speed cabling

- Cat. 8 developed for 40 GBit ethernet, but 40 GBit ethernet has "no" interest any more
- For copper cabling are 25 GBit and 50 GBit ethernet more interesting
- Cabling types Class FA / Cat. 7A and Cat. 8 may be used for 25 GBit Ethernet
- Limit for cabling is attenuation, i.e. shorter lengths

# Difficult challenges for Cat. 8

- Length limitation to 40 m restricts application to mainly data centres
- Datacentres have ALREADY another solution (twinax cabling)
- 25 GBit Ethernet can run on Cat. 7A having extended frequency to 1250 MHz
- PERSONAL OPINION: Cat. 8 will likely not be used

# Potential "Category 9"

- Technology is available for "Cat. 9" copper cabling and might be defined to 2,5 GHz
- The significant limitation is signal strength, i.e. attenuation