ISO/IEC SC25/WG3 Meeting

Buenos Aires: 6-10 February 2006

- Structured Cabling Systems -

report for IEEE 802.3an by Alan Flatman

46 Participants 18 Nations

Key Items:

- TR-24750 Installed Cabling to Support 10GBASE-T forwarded as a 2nd PDTR
- ISO/IEC 11801 Ed. 2.1 incl. Class $E_A + F_A$ cabling forwarded as a 2nd FPDAM
- liaison to request to 802.3an on 3 items:

1. replacement terms to reconcile differences with 802.3an
2. 802.3an verification of latest TR-24750 text
3. availability of TR-24750, ISO/IEC 11801 Ed.2.1 drafts

ELFEXT vs ACR-F
Alien ELFEXT vs Alien ACR-F

- 802.3an uses IL of disturbed channel pair
- ISO/IEC uses IL of disturbing channel pair
- not such an issue for ELFEXT & PSELFEXT, as channel pairs are same length & have similar IL
- big issue for PSAELFEXT, as channels are generally different lengths

ELFEXT vs ACR-F
Alien ELFEXT vs Alien ACR-F

- **replacement terms (from IEC) introduced to reconcile these differences:**

  ELFEXT is replaced by ACR-F (far-end ACR) using IL of disturbed channel pair

  PS ELFEXT is replaced by PS ACR-F (far-end PS ACR) using IL of disturbed channel pair

  ACR is replaced by ACR-N (near-end ACR)

  PS ACR is replaced by PS ACR-N (near-end PS ACR)

  PS AELFEXT is replaced by PS AACR-F (far-end attenuation to alien crosstalk ratio) using IL of disturbed channel pair

  To contend with asymmetric lengths, normalised AFEXT is defined, accounting for *difference* between disturbed & disturbing channel lengths, when IL of disturbing channel pair is less

ISO/IEC TR-24750
Installed Class E/F to Support 10GBASE-T

- 1st PDTR failed; 16 nations in favour, 8 against
- replacement terms introduced from IEC (slide 3)
- compliance accomplished on a channel basis
- permanent link requirements added as informative annex to support confidence testing
- AXT margin computation requirements as per 802.3an D3.1 but with modified terms & format to be consistent with the rest of TR-24750
- planned to become a TR after Sep 2006 meeting
- mirrors technical requirements of 802.3an D3.1
- may differ from TIA/EIA TSB-155 on terminology

ISO/IEC 11801 Edition 2.1 (introducing Class E_A & Class F_A Cabling)

- 1st FPDAM failed; 11 nations in favour, 9 against
- will specify channel, links, cords, components
- replacement terms introduced from IEC (slide 3)
- Class E_A NEXT, PSNEXT limits still extrapolated
- 10GBASE-T added to supported applications
- planned to go to FDAM after Sep 2007 meeting
- captures technical requirements of 802.3an D3.1
- technically different to TIA “Cat 6 Augmented”

Channel Parameter	ISO/IEC TR-24750 PDTR Installed Class E+F	ISO/IEC 11801 Ed.2.1 FPDAM Class E_A	ISO/IEC 11801 Ed.2.1 FPDAM Class F_A
Return Loss	Ed.2 RL extrapolated to 500 MHz + 6dB plateau	Ed.2 RL extrapolated to 500 MHz + 8dB plateau @ 251.2 MHz	Ed.2 RL extrapolated to 1000 MHz + 8dB plateau @ 251.2 MHz
Insertion Loss	Ed.2 Class E IL extrapolated to 500 MHz	Ed.2 Class F IL extrapolated to 500 MHz	1.05(1.8sqrt(f)+0.005(f)+ 0.25/sqrt(f)) + 4x0.02sqrt(f)
NEXT	Ed.2 Class E NEXT extrapolated to 330 MHz, 31-50log(f/330) in range 330-500 MHz	Ed.2 Class E NEXT extrapolated to 500 MHz	Ed.2 Class F NEXT extrapolated to 1000 MHz with values >600 MHz “ffs”
PS NEXT	Ed.2 Class E NEXT extrapolated to 330 MHz, 28-42log(f/330) in range 330-500 MHz	Ed.2 Class E NEXT extrapolated to 500 MHz	Ed.2 Class F NEXT extrapolated to 1000 MHz with values >600 MHz “ffs”
ACR-F (ELFEXT)	Ed.2 Class E ELFEXT extrapolated to 500 MHz	Ed.2 Class E ELFEXT extrapolated to 500 MHz	Ed.2 Class F ELFEXT extrapolated to 1000 MHz with values >600 MHz “ffs”
PS ACR-F (PS ELFEXT)	Ed.2 Class E ELFEXT extrapolated to 500 MHz	Ed.2 Class E ELFEXT extrapolated to 500 MHz	Ed.2 Class F ELFEXT extrapolated to 1000 MHz with values >600 MHz “ffs”
PS ANEXT	$27.48+IL_{(250)}/1.04-10\log(f/100)$ 1-100 MHz $27.48+IL_{(250)}/1.04-15\log(f/100)$ 100-500 MHz	80-10log(f) 1-100 MHz 90-15log(f) 100-500 MHz	95-10log(f) 1-100 MHz 105-15log(f) 100-1000 MHz currently marked as “ffs”
PS AACR-F (PS AELFEXT)	$22.22+IL_{(250)}/2.29-20\log(f/100)$ -10log(L/100) 1-500 MHz	77-20log(f) 1-500 MHz	92-20log(f) 1-1000 MHz currently marked as “ffs”

ISO/IEC 11801 Edition 2.1
Balanced Cabling EM Performance

- comprehensive EM specifications being introduced
- coupling attenuation values increased by 10dB for all environmental classifications
- TCL values modified slightly to fit measurements
- proposals to apply coupling attenuation + balance to both screened and unscreened cabling
  - cannot accurately measure balance above 100 MHz
  - CA measurements up to 1GHz is useful EMC data
  - need to compare UTP+STP as “apples with apples”
  - specification of coupling attenuation for UTP is “ffs” and balance for screened cabling is “ffs” to leave the *door open*

Balanced Cabling EM Performance E_1 (Commercial Office)

		unscreened	screened
Balance (dB)	TCL Class D Class E, E_A, F, F_A	40-20log(f) 1-100MHz 53-15log(f) 1- 30MHz 20dB slope >30MHz	not specified (ffs)
	ELTCTL Class E, E_A, F, F_A	30-20log(f) 1-30MHz	not specified (ffs)
EM attenuation (dB)	Coupling Attenuation Class D, E, E_A, F, F_A	not specified (ffs)	40 30- 100MHz 80-20log(f) 100-1000MHz

Balanced Cabling EM Performance E_2 (Light Industrial)

		unscreened	screened
Balance (dB)	TCL Class D Class E, E_A, F, F_A	 63-15log(f) 1- 30MHz 63-15log(f) 1- 30MHz 20dB slope >30MHz	not specified (ffs)
	ELTCTL Class E, E_A, F, F_A	30-20log(f) 1-30MHz	not specified (ffs)
EM attenuation (dB)	Coupling Attenuation Class D, E, E_A, F, F_A	not specified (ffs)	50 30- 100MHz 90-20log(f) 100-1000MHz

Balanced Cabling EM Performance E_3 (Heavy Industrial)

		unscreened	screened
Balance (dB)	TCL Class D Class E, E_A, F, F_A	 73-15log(f) 1- 30MHz 73-15log(f) 1- 30MHz 20dB slope >30MHz	not specified (ffs)
	ELTCTL Class E, E_A, F, F_A	30-20log(f) 1-30MHz	not specified (ffs)
EM attenuation (dB)	Coupling Attenuation Class D, E, E_A, F, F_A	not specified (ffs)	60 30- 100MHz 100-20log(f) 100-1000MHz

Future Meetings

ISO/IEC SC25 WG3	**18-21 Sep 2006**	**Berlin**
ISO/IEC SC25 WG3	**26 Feb–2 Mar 2007**	**TBA**
ISO/IEC SC25 WG3	**??? Sep 2007**	**Korea**