N°2 WhitePaper

MultimediaConnect

THEME OF THE MONTH

COPPER NETWORKS: NEW IN AMENDMENT 1.0 AND 2.0 TO ISO 11801, Ea/Fa CLASS... AND MORE!

The main objective of amendments 1.0 and 2.0 to ISO 11801 is to define the electric performance of Ea (500Mhz) Class and Fa (1000Mhz) Class systems that were not included in the previous version.

They do however contain other modifications that are just as important, if not as widely known. This guide will summarize the new information found in these two new regulatory documents. We will focus on the modifications to test parameters. More specifically, changes have been made to ACR, and ELFEXT no longer exists... as you read this guide you will discover a lot of changes... Enjoy!

IN A NUTSHELL...

ISO 1801 AMD 1.0

RATIFIED

CLASS Ea/Fa CHANNELS are defined and and a corrigendum for ISO 11801 version 2.0 was approved in 2008.

ISO 1801 AMD 2.0

NON-RATIFIED

PERMANENT LINK and CLASS Ea/FA COMPONENT performances are defined. Changes to the content of the initial document to include, for example, OM4 fibre.

Awaiting approval by the ISO Committee, it will be put to vote in August 2009

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A - CONNECTION LENGTH RULES

Amendment 1.0 to the ISO standard includes a table that summarizes lengths by connection type:

FD - Floor Distributor **CP** - Consolidation Point **TO** - User Connection

SEGMENT	MINIMUM in metres	MAXIMUM in metres
FD - CP	15	85
CP - TO	5	Depends on connection
FD - TO (si pas CP)	15	90
Cordon utilisateur a*	2	5
Cordon de brassage b**	2	5
Tous cordon confondus	-	10

a If there is no consolidation point, the user cable length may be 1m*
*b** If there is no supply cable, the patch cable length may be 1m*

Extract Table 31 Amendment 1.0/ISO-IEC 11801

. LENGTH OF CONSOLIDATION CONNECTIONS IN CLASS E AND CLASS EA

The adjacent connection lengths are simulated based on 10m of patch cable in addition to the two cables.

SEGMENT FD - CP in metres	Rigid cable CO - TO SEGMENT in metres	Flexible cable CP - TO SEGMENT in
15 m	75	47
25 m	65	41
35 m	55	34
45 m	45	27
55 m	35	21
65 m	25	14
75 m	15	7
85 m	5	3

. BACKBONE CABLE LENGTHS BY CATEGORY

Connection lengths excluding patch cables

COMPONENTS	CLASS A*	CLASS B*	CLASS C*	CLASS D*
CAT 5e	2000	235	155	90
CAT 6	2000	245	170	96
CAT 7	2000	245	175	100

*Excluding applications limited by the signal propagation time

B - CHANGES TO MEASUREMENT PARAMETERS FOR THE SIGNAL TO-NOISE RATIO

You may be surprised to see certain parameters replaced by unfamiliar new names when looking at changes made to cable testing.
ACR and ELFEXT have been renamed. However, beyond simple name changes, the methods used to calculate the values have also been changed.

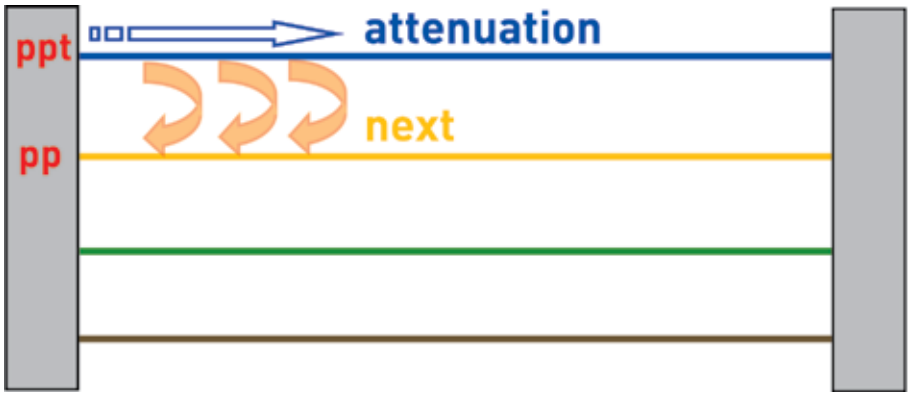
Summary table

OLD NAME	NEW NAME	DEFINITION
NEXT	No change	Sending a test signal to one of the pairs, and receiving the signal on the other pair at the same end.
PS NEXT	No change	Power Sum Near End Crosstalk: source and reading taken on a pair at the same end
ACR	ACR-N	Attenuation to Crosstalk Ratio Pair-Pair: margin between PS NEXT and attenuation
PS ACR	PS ACR-N	Power Sum Attenuation to Crosstalk Ratio: margin between PS NEXT and attenuation
ELFEXT	ACR-F	Equal Level Far End Crosstalk pair-pair: margin between PP FEXT and attenuation
PS ELFEXT	PS ACR-F	Power Sum Equal Level Far End Crosstalk: margin between PS FEXT and attenuation

We will illustrate these changes by using ACR, which has been changed to ACR-N, as an example

ACR, also known as the signal-to-noise ratio, was previously calculated using the difference between the near-end crosstalk (Next) of one pair and the attenuation of the interfering pair. The calculation has been changed in order to better reflect the electrical reality of the signal-to-noise ratio, and to better reflect the actual transmissions on the pair. It becomes: ACR-N. This parameter is calculated by subtracting a pair's Next from its own attenuation.

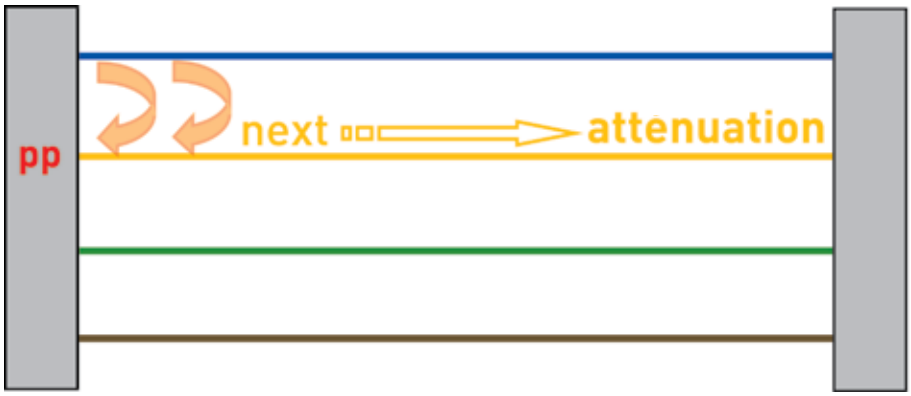
OLD METHOD (ACR):



pp = pair subject to interference
ppt = interfering pair

ACR = NEXT pp - Attenuation ppt

NOUVELLE METHODE (ACR-N) :



pp = pair subject to interference

ACR-N = NEXT pp - Atténuation pp

C - ALIEN CROSSTALK MEASUREMENT
understanding the new measurement parameters

ALIEN CROSSTALK describes the electromagnetic coupling between pairs in the direct cabling environment.

Alien Crosstalk is actually measured using various electric parameters that are described in the following table:

PARAMETERS	DEFINITION
Alien Crosstalk *Alien crosstalk*	Signal coupling between an interfering pair from one channel, and another pair on another channel.
AFEXT **Alien Far-end Crosstalk loss** *Alien Far-end Crosstalk loss*	Crosstalk between an interfering pair from one channel, and another pair on another channel, measured at the far end.
ANEXT **Alien Near-end Crosstalk loss** *Alien near-end crosstalk*	Crosstalk between an interfering pair from one channel, and another pair on another channel, measured at the far end.
AACR-F **Attenuation to Alien Crosstalk Ratio at the Far-end** *Ratio between alien crosstalk and attenuation at the far end*	Difference between far-end alien crosstalk and the attenuation of the disrupted pair on the same channel, expressed in dB.
AACR-N **Attenuation to Alien Crosstalk Ratio at the Near-end** *Ratio between alien crosstalk and attenuation at the near end*	Difference between near-end alien crosstalk from the disruptive pair, and the attenuation of the disrupted pair on the same channel.

Source COEL

ABOUT CAE LABS^

CAE Labs' technical department is a member of the French UTE standardization committee, responsible for structured cabling proposals.