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It's that Data Cabling Melting Pot Again!..... 1

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- Protocol Network Integration (396)
- Dwellight (397)
- Branch Technologies (398)
- Fibre Optic Installation Services (399)

It's that Data Cabling Melting Pot Again!

As reported in our last *Newsletter*, when Mike Gilmore (FIA Standards Director and the Senior Partner with The Cabling Partnership) gave his first seminar on the controversies and situations on Standards within the data cabling field, he drew around 35 delegates to his presentation at BSI's building in Chiswick

The title was **Data Cabling - Into the Melting Pot**. On the 24th February and at the same location, over 70 delegates were present for an update on the situation - this time called **Data Cabling - Crawling Out of the Melting Pot?**

Covering Cat 5, Cat 6, Cat 7 and fibre, the real and fundamental issues in the various fields were put into sharp focus by the speaker. What became very clear during the session was that, if data cabling is, in fact, climbing out of the 'melting pot', it is doing so with a lot of painful soul searching, a great deal of work by dedicated specialists, and at a fairly slow pace.

Perception

While the Cat 5 situation is now becoming more settled with the introduction of Cat 5e making Gigabit Ethernet quite possible over the newly specified networks. Cat 6 and Cat 7 remain in a somewhat nebulous situation in that many issues have to be resolved before installations can truly be considered as meeting all the required Standards - simply because these Standards do not yet exist. While the inevitable vacuum exists, Mr Gilmore strongly urges the networking market to be aware that, when standards are introduced, the requirements may bear little relation to the way they are perceived at the moment. Interoperability and backwards compatibility, the types of connectors that will be used and a host of other variables make even the token efforts to create Cat 6 and Cat 7 type networks a dangerous exercise.

He is certainly not against the installation of cabling that gives better performance but this should not be carried out with the fond expectation that it will perform correctly with other Cat 6 or Cat 7 products when current problems are solved. The chances are that some performance shortfalls will result.

FIA Seminar

These issues will be briefly discussed by Mr Gilmore during his presentation at the FIA Seminar to be held at the Cable & Wireless College, Coventry on Thursday, 15th April 1999. This has been organised in partnership with the Cable & Wireless College.

We will not pre-empt what will be detailed in Coventry but it might be useful to look at the current situation with regard to the development of Standards in the Cat 5, Cat 6 and Cat 7 areas as well as the fibre situation.

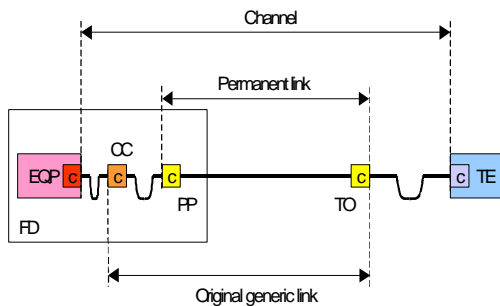
ISO/IEC JTC1 SC25 WG3

This meeting took place in Mexico last January. In addition to ISO/IEC JTC1 SC25 WG3, IEC TC48B convened to review the options for a Category 7 connecting hardware interface at the Telecommunications Outlet (TO).

The key elements within the meeting can be detailed as follows:

ISO/IEC 11801 Amendment 2

ISO/IEC 11801 PDAM 3 (which will now be published as AM2) is the most significant amendment being made to ISO/IEC 11801. It contains the permanent link (see below) and channel requirements (but not the components specifications) necessary to support 1000BASE-T.



There are a significantly larger number of parameters which have to be met when compared to ISO/IEC 11801 (1995) which effectively only had requirements for attenuation, NEXT and ACR.

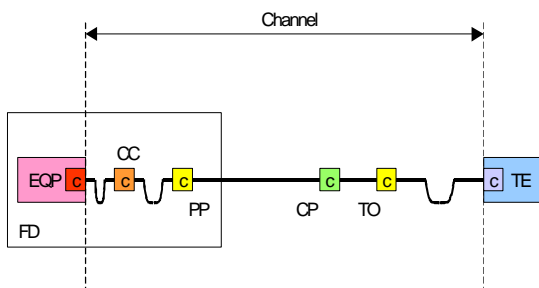
ISO/IEC 11801 2nd Edition

Here, the headline issues are:

- the horizontal cabling model
- Class D links and channels (2nd edition) together with Cat 5 components (2nd edition)
- Class E links and channels together with Cat 6 components;
- Class F links and channels together with Cat 7 components;
- Optical fibre links, channels and connecting hardware.

The 2nd edition of ISO/IEC 11801 will support an implementation of horizontal cabling which includes a Consolidation Point (CP) as shown in the next column. This is termed the '4-connector model' and is applicable to all classes of installed performance and component Categories.

The four connections are the TO: Telecommunications Outlet, CP: Consolidation Point, PP: Patch Panel and CC: Cross-connect



This is a significant departure from the existing model. The ISO/IEC 11801 (1995) only allows for a Transition Point which is assumed to be electrically or optically "invisible". The Transition Point is also not a point of administration and is not an interface as far as testing is concerned. The CP is assumed to have the same electrical/optical performance as the TO, it is a point of administration and it may be a test interface. This creates a significant number of problems which are addressed in the following sections.

It should be pointed out that the model dimensions have not changed i.e.

- the maximum physical length between TO and PP is still 90 metres;
- the maximum physical channel length is still 100 metres;
- performance calculation assumes a 90+10 design.

Copper Issues

It was proposed that the link and channel specifications defined in the USA as Cat 5e (to be published as Addendum 5 of ANSI/TIA/EIA 568A) should be used as Class D requirements in the 2nd edition of ISO/IEC 11801. This was accepted. At first sight this simply requires an improvement of NEXT and PSNEXT but there are underlying levels of complexity that affect the figures which might eventually be used.

The Class E link and channel specifications appear to be stable. All the relevant parameters have been specified and are based on formulae. The 4-connector model is used with the components and installed cabling being specified up to 250MHz (even though the PSACR=0dB occurs at 200MHz as per the original intention of Class E).

The big area of concern is that of connecting hardware:

- intermateability (mechanical interworking between different suppliers);
- inter-operability (electrical interworking between different suppliers);
- backwards compatibility (the maintenance of Cat 5 performance when mated with Cat 5 joint i.e. the problem of perfect matching where male and female connectors come from different suppliers).

For the present all discussion of these issues was passed into the domain of IEC TC48B. However, it will no doubt come back to the cabling ISO/IEC JTC1 SC25 WG3 when the complexity of the problem is understood.

The Class F link and channel specifications have now begun to stabilise. Not all the relevant parameters have been specified yet but those that have been are based on formulae. The original intention of Class F was for a PSACR=0dB at 600MHz. This is not delivered by the 4-connector model (the appropriate frequency is approximately 475MHz). ACR (not PSACR)=0dB at 600MHz is delivered by the 2-connector model.

The most significant outstanding task in the Class F/Category 7 area is the selection of the connecting hardware interface at the TO. Nine candidates had been agreed to fulfil the technical criteria previously defined by ISO/IEC JTC1 SC25 WG3 for a Category 7 interface:

1. Non-RJ45
2. Siemon, Thomas & Betts, Sofim, Telesafe, a German national input (Harting) and BKS
3. RJ45
4. Alcatel, AMP and the existing RJ45 with only two pairs used

The following decisions were taken in ISO/IEC JTC1 SC25 WG3:

- the 2-pair RJ45 solution was discounted;
- the two 4-pair RJ45 solutions (Alcatel and AMP) were clearly not intermateable or interoperable. However, it was decided that an RJ45 solution was preferred if possible. AMP and Alcatel were instructed to undertake joint work to provide a

single intermateable and interoperable solution by the June meeting of ISO/IEC JTC1 SC25 WG3. If they did so then this would be accepted as the Category 7 TO solution. If not then one of the two would be selected.

- one of the six non-RJ45 options will be selected as a back-up solution. The selection will be made by a group of six independent experts based upon a list of criteria agreed at Cancun
- and presented to the meeting of ISO/IEC JTC1 SC25 WG3 in June.

Optical fibre issues

High bit-rate applications are bandwidth-limited (rather than attenuation limited) for multimode optical fibre. Discussions are beginning to take place in IEEE with regard to multi-Gigabit applications. These will be even more restricted. ISO/IEC JTC1 SC25 WG3 decided to consider the possible changes to multimode optical fibre specifications that might be required by such applications. Options include:

- higher bandwidth products (50/125 m and 62.5/125 m);
- wavelength division multiplexing techniques;
- new optical fibre designs.

These will be discussed at the next ISO/IEC JTC1 SC25 WG3 meeting in June.

The connecting hardware interface at the TO has long been the object of interest for the optical fibre experts in ISO/IEC JTC1 SC25 WG3. In Mexico, the benefits offered by the latest "Small Form Factor" (SFF) connectors were discussed. It was decided that the small footprint (similar to an RJ45) of these connection systems was of considerable value at

patch panels and equipment. The term SFF would be defined in ISO/IEC 11801 2nd Edition, as would the importance of high density connections at Campus, Building and Floor Distributors. The advantages offered by SFF connectors were less clear at an outlet where the depth of the box

Other ISO/IEC Activities

ISO/IEC 14763-1 "Administration", ISO/IEC 14763-2 "Planning and installation" and ISO/IEC 14763-3 "Testing of installed optical fibre cabling" have all completed their development phase and will be published in 1999.

CENELEC TC215

This meeting took place in Brussels in February 1999.

The key elements within the meeting are detailed in the following sections.

EN 50173 Amendment

EN 50173 A1 contains the permanent link and channel requirements (but not the components specifications) necessary to support 1000BASE-T. While not being textually identical to ISO/IEC 11801 (1995) PDAM3, EN 50173 A1 contains identical requirements for the "permanent link" and channels. Publication is expected during 1999.

EN 50173 2nd Edition

The development of text for the 2nd edition of EN 50173 has been proceeding well. CENELEC has developed its revision from the "bottom-up" and revised text has been produced for much of the document. Significant effort has been expended in creating the correct structure for the document and in addressing the foundation issues of cabling structure and models. Certain clauses depend also depend upon the outcome of decisions in ISO/IEC JTC1 SC25 WG3 but CLC TC215 WG1 as initiated its own activity because the issue of connecting hardware is so complex.

At the ISO/IEC JTC1 SC25 WG3 meeting in Orlando (January 1998), it was agreed that it was impossible to develop the concept of "optical fibre classes" in parallel to those for copper cabling. The reason for this was that optical fibre applications have not been developed for "generic cabling" models in the same way as copper applications have been.

Since that time significant work has been undertaken in CLC TC215 WG1 with regard to planning information which presents optical fibre in a much clearer and technically correct way.

EN 50174-1 "Installation"

The comments on the 6MP have been received. They will be resolved at the next meeting of CLC TC215 WG1 in April. However, comments which relate to the inter-working of WG1 and WG2 were due to be resolved in early March to allow work on EN 50174-2 to proceed.

Further developments will be discussed by Mr Gilmore at his next Chiswick seminar.