EC **Cabling*News***

News from DELTA EC Cabling - May 2011

In order to strengthen the engineering capability in our department we have welcomed Lars Lindskov Pedersen as a new member of the team. Lars has a background as M.Sc.E.E. from the Technical University of Denmark and comes from a position as New Technology and Standardisation Manager in the Network Connectivity group of Schneider Electric. During the time of his employment in Schneider Electric he was involved in activities such as product development (connecting hardware, residential networks, etc.), team management, and standardisation activities within cabling and cabling components.

Lars will participate in all engineering tasks of our group and take part in our standardisation activities, among these be our main participant in connector standardisation groups.

News on International Standardisation

By Erik Bech and Lars Lindskov Pedersen

Standardisation of cables

SC 46C/WG 7

The last meeting in SC 46C/WG 7 was held on 14 April 2011 in Frankfurt. This work group is responsible for standards for twisted pair data cables. The important standards from this group are the IEC 61156 series, where -1 is for general requirements (including test methods), -5 is for horizontal cables, and -6 is for flexible cables.

Christian Pfeiler from DRAKA is a new convener of this group.

Work on amendments to IEC 61156-5, -6, -7, and -8 are going on:

1. A new type for requirement of coupling attenuation is introduced. The requirement of the new type 1b will be 70 dB. This will fill in the big gap in the current standard between type 1 and 2, which is from 85 dB to 55 dB.
2. It is proposed to introduce a minimum requirement for DC resistance of cable screens in order to assure that transfer impedance may be complied with. The required DC resistance shall be less than 30 mΩ/m.
3. Current requirements for resistance unbalance between pairs will be removed. No applications require this specification.

New work about measuring the temperature behaviour of bundled cables was rejected because there were too few countries who wanted to participate.

A document, IEC/TR 61156-1-3 Ed. 1.0: Multicore and symmetrical pair/quad cables for digital communications - Part 1-3: Electrical transmission parameters for modeling cable assemblies using symmetrical pair/quad cables used for digital communication, has been issued. The document deals with length correction formulas for the parameters NEXT and ELFEXT. This is a part of work for modeling channel and link performance from component performance and channel/link topologies. This work will be performed together with experts from JTC 1/SC 25/WG 3 and SC 48B in a joint work group.

A second CD for the document IEC 62222 ed. 2 about fire performance of communication cables installed in buildings is ready.

Future copper cabling, for applications beyond 10 GBase-T, was discussed. Which cables would be needed and how to test performance of these cables are not known yet. This is because developments of the applications have not been started. It is however, anticipated that test methods above 1 GHz is needed and therefore balunless measurements have to be developed. Mixed mode test methods, using modal decomposition, are available from instrument manufacturers, but will have to be introduced in our test standards before they can be used.

The next meeting in the group is scheduled for 5 October 2011 in Myrtle Beach, USA.

Standardisation of cabling

JTC 1/SC 25/WG 3

The last meeting in JTC 1/SC 25/WG 3 was held on 2-5 May 2011 in Berlin. This work group is responsible for cabling standards, where ISO/IEC 11801 is the most important.

This generic cabling standard now consists of ISO/IEC 11801 ed. 2: 2002 plus amendment 1: 2008 and amendment 2: 2010. The standard is now very difficult to read because the amendments are just corrections and additions to the basic document. A consolidated document, where the basic document and the amendments are merged, has now been drafted and sent to the IEC central office for publication. It should be possible to buy the document next month. The edition number is 2.2 and there are no new technical requirements in the standard.

Work on the next edition 3 of the standard is expected to start about one or two years from now (requirements for cabling of support to new applications such as 40GBase-T and 100GBase-T). It is expected that the standard will be separated in a general document and documents for premises specific cabling, e.g. for office, industrial, homes, and data center cabling. This is the same structure as used in the European standard for generic cabling, EN 50173.

In IEEE, the first 40 Gb/s and 100 Gb/s Ethernet standard, IEEE 802.3ba, was published June 2010. This standard contains a number of different physical layer specifications for twinaxial copper, electrical backplane, single-mode fiber (SMF), and multimode fiber (MMF). Reach is dependant on the media and the physical layer specification and goes from 1 m on electrical backplane over 7 m (twinaxial) and 100 m (MMF) up to 40 km on SMF. New projects have been started subsequently, e.g. IEEE 802.3bg for 40Gb/s serial SMF (reach 2 km) (approved March 2011) and the 100 Gb/s Backplane and Copper Study Group. No work has been initiated on higher speed Ethernet on twisted pair as the market is not considered ready for this, i.e. currently no work is going on to develop a 40GBASE-T or 100GBASE-T standard.

The standard for cabling in data centers, ISO/IEC 24764 was issued as edition 1 in April 2010. A new work item for an amendment was prepared and is now ready for circulation. The content of the amendment is to allow more link segments to be connected in series. This will be allowed as long as the channel requirements for the complete channel are compliant. In addition allowance for an extra intermediate distributor is given.

The standard for planning and installation will be issued as ISO/IEC 14763-2. In the meeting many comments to the draft standard were resolved. The document is now on the FDIS (final draft international standard) stage.

A task force, who is working with modeling, has been formed with experts from cabling, cables, and connecting hardware work groups, but no work has been performed since last meeting. In this meeting a work plan for the task was developed. Currently there are three different models, which are not complete: 1: The current model in annex F of ISO/IEC 11801. 2: Proposal from the German national committee. 3: Proposal from the Canadian national committee. It is the goal to develop a model, which can be used for all primary cabling parameters and be used at higher frequencies anticipated for future cabling.

The next meeting in JTC 1/SC 25/WG 3 is planned for Melbourne 27-30 October 2011.

Standardisation of connecting hardware

SC 48B/WG 3

The last meeting in SC 48B/WG 3 was held on 12 April 2011 in London. This group is responsible for development of standards for connectors. The main standards for data transmission connectors are the IEC 60603-7-series and the IEC 61076-series.

The IEC 60603-7-series (RJ45 type connectors) has been revised during the last couple of years in order to obtain a more streamlined series of standards, e.g. by harmonization of the terminology, removal of test methods that are now covered by separate test standards (mainly IEC 60512-series) and avoiding duplication of information already contained in the base specifications of the series. With the publication of edition 3.0 of IEC 60603-7-1 “Connectors for electronic equipment - Part 7-1: Detail specification for 8-way, shielded, free and fixed connectors” in April 2011, the revision of the series has now been finalized and new editions published for all parts. A first amendment to IEC 60603-7 “Connectors for electronic equipment: Part 7: Detail specification for 8-way, unshielded, free and fixed connectors” (primarily inclusion of table for test group EP to make the standard more complete as the base specification for the whole series) has been approved for publication.

A second edition of IEC 61076-3-110 “Connectors for electronic equipment - Product requirements - Part 3-110: Detail specification for shielded, free and fixed connectors for data transmission with frequencies up to 1000 MHz” is in development (CDV circulated). This standard describes connectors that can be used as Category 7_A connectors and that are similar to the IEC 60603-7-7 and IEC 60603-7-71 connectors, but without the internal switch-function.

For IEC 61076-3-104 “Connectors for electronic equipment - Product requirements - Part 3-104: Detail specification for 8-way, shielded free and fixed connectors for data transmissions with frequencies up to 1000 MHz” – another Category 7_A connector type – a new edition (3.0) is in planning with a possible extension of the upper frequency to 1500 or even 2000 MHz. No formal drafts are available yet.

A new standard for circular connectors specified up to 500 MHz, IEC 61076-2-109 “Connectors for electronic equipment - Product requirements - Part 2-109: Circular connectors - Detail specification for connectors M 12 x 1 with screw-locking for data transmissions with frequencies up to 500 MHz” is in development. The standard specifies up to Category 6_A performance level with respect to transmission characteristics, and the connectors are typically to be used in environments requiring a certain ingress protection, e.g. industrial environments.

The next meeting in SC 48B/WG 3 is planned for 11 October 2011 in Beijing.

SC 48B/WG 5

The last meeting in SC 48B/WG 5 was held on 13 April 2011 in London. This group is responsible for development of standards for test methods for connecting hardware. The main standards for these test methods are the IEC 60512 series.

For IEC 60512-26-100 “Connectors for electronic equipment - Tests and measurements - Part 26-100: Measurement set-up, test and reference arrangements, and measurements for connectors according to IEC 60603-7 - Tests 26a to 26g” (the de-embedding test method for Cat. 5 and Cat. 6), amendment 1 with an update on the triaxial test setup for transfer impedance test, has been published in March 2011.

The “de-embedded/re-embedded” connector test standard, IEC 60512-27-100 “Connectors for electronic equipment - Tests and measurements - Part 27-100: Signal integrity tests up to 500 MHz on IEC 60603-7 series connectors - Tests 27a to 27g” (developed for Cat. 6_A), is progressing and about to be circulated as FDIS (final draft international standard).

IEC 60512-28-100 “Connectors for electrical equipment - Tests and measurements - Part 28-100: Signal integrity tests up to 1000 MHz on 60603-7 and 61076-3 series connectors - Tests 28a to 28g” covering test methods for Cat. 7 and Cat. 7_A connectors ,is in development. Comments to the CD – of which the majority were from DK experts - were reviewed during the meeting. The document will be amended accordingly and supposedly circulated as a CDV soon.
A new work item has been approved for a test standard for circular connectors. A first CD for this standard - IEC 60512-29-100 “Connectors for electronic equipment - Tests and measurements - Part 29-100: Signal integrity tests up to 500 MHz on M12 style connectors - Tests 29a to 29g” is in preparation.

The next meeting in SC 48B/WG 5 is planned for 12 October 2011 in Beijing.

SC 48B/AG1

A new study group AG1 “Trends and Planning” has been established under TC48 and had its first meeting 13 April 2011 in London in connection with the SC 48B WG meetings. The main objective for AG1 is to collect and prioritize ideas for future work items under TC48, provide input to TC48 on the strategic business plan, and to motivate NCs to launch NWIP on selected work items. A brainstorming session for potential new projects and activities in SC48B was held and preliminary “owners” identified. The potential new work items are to be discussed at the next AG1 meeting, which will take place during the TC 48 plenary meeting in Beijing in October 2011.