



EC Cabling News

News on International Standardisation

By Lars Lindskov Pedersen - March 2013

Next generation cabling – 40 Gbit/s Ethernet on balanced twisted pair copper cabling

During the last year, work on the next generation cabling standards have continued and been intensified. The next generation cabling is expected to support data transmission of 40 Gbit/s or more and will mainly be targeted at data centre applications. This newsletter is focussed around this subject and some of the on-going work is discussed below.

IEEE – development of 40GBASE-T standard

After a successful “Call for Interest” (CFI), a study group was formed in IEEE in July 2012 to start investigations for the “Next Generation BASE-T”. The study group has now completed its work on technical feasibility, market potential etc. and will at the IEEE 802 plenary in March request the formation of a Task Force 802.3bq to continue the work in a formal standardisation project. The objective of the proposed NGBASE-T is to support a 40G data rate using a 4-pair, balanced twisted pair copper cabling channel with a length of up to 30 m, and having up to 2 connections. The proposed channel configuration will thus be restricted in both length and number of connections compared to the well-known reference implementations for current classes D to F_A, and will primarily be intended for EoR (End-of-Row) and ToR (Top-of-Rack) connections in data centres.

Standardisation of cabling in ISO/IEC JTC 1/SC 25/WG 3

Working group 3 of JTC 1/ SC 25 is responsible for cabling standards, with ISO/IEC 11801 - Generic cabling for customer premises - being one of the most important. The scope of WG 3 also includes test procedures and planning and installation guides.

The 54th meeting of ISO/IEC JTC 1/SC 25/WG 3 was held on 25 February – 01 March 2013 in Ixtapa, Mexico. The meeting was attended by more than 50 experts and DELTA was represented by Lars Lindskov Pedersen.

On the agenda was, among other subjects, the further development of the technical report ISO/IEC TR 11801-99-1 titled “Information technology - Guidance for balanced cabling in support of at least 40 Gbit/s data transmission”. The report contains proposals for channels and channel specifications based on existing Cat. 6_A and Cat.7_A with extended upper frequency as well as based on new components, which are “improved and extended” Cat. 6_A and Cat. 7_A, and serves as input to IEEE for the development of the future 40GBASE-T standard. The report was distributed for voting and commenting in November 2012 as a PDTR (proposed draft technical report) and received substantial support, but also a number of technical comments which were discussed and resolved at meeting. The main conclusions from the discussions at the meeting are as follows:

- The channel configurations will be based on a maximum length of 30 m and maximum 2 connections, i.e. aligned with IEEE proposal.
- The upper frequency limit will be 1600 MHz with up to 2000 MHz for further study.
- The names of the new channels are proposed as Class I (based on improved and extended Cat. 6_A) and Class II (based on improved and extended Cat. 7_A)
- The names of the new components are proposed as Cat. 8-I (for Class I) and Cat. 8-II (for Class II).

It should be emphasised that the channel requirements (for 40 Gbit/s) at present are still only preliminary and that the requirements will be aligned with IEEE specifications when these are available.

At the meeting, it was agreed that the work on the next edition (3rd) of ISO/IEC 11801 should be submitted as a formal new work item proposal. The 3rd edition will include a restructuring of the ISO/IEC generic cabling standards as well as a number of technical updates. The restructuring is basically a reshuffling of the generic cabling standards for office premises, industrial premises, homes, and data centres into a series of standards ISO/IEC 11801-x with a structure similar to what is known from the European cabling standards EN 50173-x. The technical changes to implement for the 3rd edition will include the addition of the new classes in support of 40Gbit/s data transmission and a revised annex on modelling, which is the outcome of the work in JMTG – joint modelling task group.

Standardisation of cables in IEC TC 46 (SC 46C/WG 7)

Working group 7 of IEC TC 46/SC 46C is responsible for standardisation of symmetrical pair/quad cables for digital communication such as the IEC 61156-series. The scope also includes standards on related test methods.

The standardisation of new cables intended for use in 40GBASE-T applications has now been started by the circulation of new work item proposals in February 2013 – one for horizontal cable with transmission characteristics up to 2 GHz and one for the associated work area cable. The NWIP's will be addressed at the coming meeting of WG 7, which takes place 8-9 April 2013 in Lyon at which DELTA expects to be represented by Lars Lindskov Pedersen.

Standardisation of connectors in IEC TC 48/SC 48B (WG 3 and WG 5)

Working group 3 of IEC TC 48/SC 48B is responsible for standards for electrical connectors such as the "RJ45"-type standardised with the IEC 60603-7-series. Working group 5 is responsible for standards for related test methods such as the IEC 60512-series.

A new work item for the development of an RJ45-type connector for data transmissions with frequencies up to 2000 MHz has been circulated in February. This connector is intended for use with the cabling currently being specified in ISO/IEC JTC 1/SC 25/WG 3. Other on-going work relevant for 40GBASE-T includes the development of 3rd edition of IEC 61076-3-104 with extension of the frequency range to 2000 MHz (Cat. 7_A-type connector). It is also expected that new work will be proposed for new connectors with frequencies up to 2000 MHz based on IEC 60603-7-71 (backwards compatible Cat. 7_A (RJ45/GG45)) and/or IEC 61076-3-110 (GG45-type).

DELTA will continue to participate actively in the standardisation of the cabling and cabling components for the future 40GBASE-T and keep our customers updated through regular newsletters.

