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NEW CABLED OPTICAL FIBRE CATEGORIES - PART II

by

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for Networking+ (April 2008)

At their February meeting in Barcelona, ISO/IEC JTC1 SC25 WG3 proposed the establishment of two new optical fibre types or Categories - one multimode and one singlemode. In terms of standardisation, it is unlikely that changes to the list of “OM”s and “OS”s will take place before 2009. However, it is likely that marketing literature will contain the new designations quite soon and it may be useful to provide advance information for specifiers and installers alike.

The new “OS”, which currently has no designation, provides performance levels somewhere between those of OS1 and OS2 - and was introduced in last months FIA column in Networking+.

The multimode variant, currently termed OM4, will provide twice the laser/VCSEL bandwidth of OM3 and is targeted to provide greater useable distance and/or lower system implementation costs for the next generation 40 Gb/s and 100 Gb/s Ethernet solutions that are currently in development.

While there is clear logic for a new OS designation, as discussed last month, the case for a new OM is more to do with state-of-the-art a la “Category 6_A” etc. It is recognised that while OM3, introduced in 2002, represented a significant development in terms of bandwidth of multimode optical fibre, the performance levels attained by premium products today are significantly in excess of that milestone. Manufacturers have long since been describing their products as OM3+, enhanced OM3 or equivalent. Of course there is no basis for comparison for their individual claims and OM4 would provide a benchmark for such products.

That in itself does not always justify a new “Category” - although it sometimes seems to be enough in the balanced cabling arena. It is also considered important by the cabling standards bodies to offer that performance uplift to an application that can then demonstrate its benefits. This is what happened for OM3 cabled optical fibre performance when IEEE used it as their 300 metre mapping of 10GBASE-SR. In line with that practice, the further improved bandwidth performance designation “OM4” has been offered to both IEEE and Fibre Channel.

Unfortunately, the questions raised by this offer begin to grow in number as the detail of the offer is analysed. It is generally true that that increased bandwidth would offer greater distances of support for current networks - but that will probably not be of interest to the applications committees who rarely if ever re-visit already published standards (for example we have no standards-based support for 1000BASE-SX over OM3). The main hope is that the new performance specification may be of interest to new applications, currently in development, such as 40 Gb/s and 100 Gb/s Ethernet. The benefits may be either that the distance of support over multimode optical fibre may be increased or that the number of parallel optical fibres required (currently four in each direction for the 40 Gb/s application) may be reduced. However, there are many that cast doubt on these hopes, intimating that the equipment providers objective is to reduce the cost of the VCSEL/laser sources, loosening

performance tolerances, which may negate any benefit obtained for the higher bandwidth optical fibre cables.

	Maximum cable attenuation (dB/km)		Minimum modal bandwidth (MHz.km)		
			Over-filled launch		"Laser" launch
Category	850 nm	1300 nm	850 nm	1300 nm	850 nm
OM1	3.5	1.5	200	500	Not specified
OM2	3.5	1.5	500	500	Not specified
OM3	3.5	1.5	1500	500	2000
OM4	3.5	1.5	1500	500	4700

Nevertheless, history has proved that once a new "Category" of anything is discussed, even at an elementary level, it will become a reality in due course. The current proposals are shown in the Table above (alongside all the other OM specifications). It has at least been agreed that the new specification products have to be backwards compatible with the existing OMs – only the laser launch bandwidth is different - although there may be many twists and turns ahead.

Further information is available via an White Paper on the FIA web-site (www.fia-online.co.uk). Enquiries can be e-mailed to jane@fiasec.demon.co.uk.or, alternatively, you can contact the FIA Secretariat in 01763 273039.