10Gb/s over fiber

A recent development in fiber is to move to a 50µm standard called OM3. OM3 uses a higher quality of thinner laser-optimized glass that contains the beam better, allowing for 10Gb/s and greater performance. Given how much further OM1 cable (the earlier standard, which by comparison uses a 62.5µm fiber) has been taken from its original 1Gb/s standard, it seems probable that 10Gb/s is merely the starting point for OM3 cable.

3Gig video over coax

Since the introduction of HDCAM SR in 2004, most engineers have viewed the dual-link interface (2 × 1.5Gb/s) as ungainly. In 2006, a new standard for 3Gb/s SDI was proposed, SMPTE 424, which can carry 60 transport formats. (See Figure 2.)

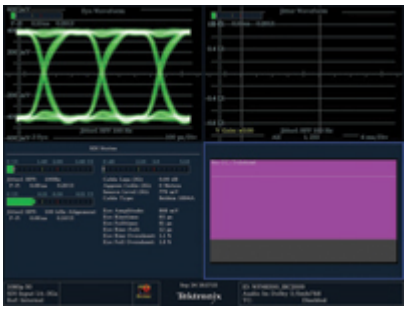

Figure 2. Testing video coax cable at 3Gb/s
Select figure to enlarge.

A 3Gig payload can carry many variations of YCbCr/RGB/XYZ color and frame rates, and you can even send two 1.48Gb/s HD-SDI streams through of a 3Gig connection, which is referred to as SMPTE 292B, an extension on the original HD-SDI spec.

Three years since the introduction of 3Gig HD-SDI, we were approached by a cable supplier to conduct a comprehensive review of different cable types and to find out how they handle the newer 1080p50/60 signals.

For 3Gb/s video, the newer 4.5GHz cables seem to be preferred over the original HD-type cable. At 3Gb/s, the coax specified for HD seems to have a workable maximum run of 60m before attenuation becomes an issue and the eye closes below 400mV.

SD coax can only reliably transmit about half the distance. This seems counterintuitive, as most SD coax has a notional analog bandwidth (+/- 6dBs) of 360MHz, three octaves less than

HD coax. The difference between the best (most expensive) and worst cable at HD before the signal becomes suboptimal (i.e. worse than 3dBs attenuation) is less than 10m.

Using cables designed for 3Gb/s HD-SDI, it was possible to reliably recover signals at lengths up to 150m with the best cable and and at lengths up to 120m with lower cost products.

Summary

As video data rates increase, installation engineers must become as familiar with fiber as they are with coax. Many types of fiber and twisted-pair copper must be purchased preterminated.

Runs of 3Gb/s in copper require special attention to cable type if long runs are required. It may be necessary to evaluate cables with the send and receive equipment to be used as not all line-drivers and receivers are equal.

Future planning will need to carefully balance the costs of fiber versus copper to minimize costs, yet achieve the buildingwide networks that collaborative file-based production demands.

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