



Technical Application Bulletin

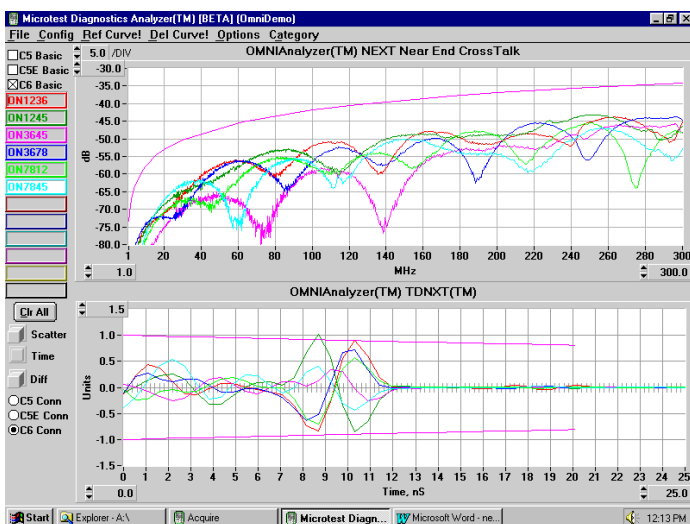
Advanced Cabling Diagnostics Using S-Bands

By Dieter Schicketanz and Josef Kosilek
Siemens AG
Munich

Siemens AG is using the Microtest® OMNIScanner™ hand-held cable tester, with its unique (patent pending) S-Band diagnostics, for both laboratory verification of connector design and patch cord production testing. We have done many measurements, comparing the accuracy of the OMNIScanner to our laboratory network analyzers, and we conclude that for our development and troubleshooting needs, the OMNIScanner is the most appropriate test device.

The S-Band technology, developed by Microtest, offers limit lines and a very comprehensive image for the NEXT and return loss in the time domain. In only few seconds, we can determine with a high degree of certainty whether the manufactured patch cords are okay or where the cause of problems is located.

In the example below where the Siemens UTP Category 6 Jack was mated with an OEM Patch Cord, one can see that despite the very large link NEXT headroom in the frequency domain, the *mated connection* tends to fail in the time domain. This provides a very strong indication that we need to improve the workmanship, or maybe replace the supplier.



The remarkably good correlation between the return loss measurements in the frequency and in the time domain is demonstrated by the following example. A Siemens S100 Category 5E shielded jack was mated with the corresponding Siemens patch cord. The return loss of the connection exhibits in the frequency domain more than sufficient headroom to the Category 5E limit, but one of the four pairs (i.e. the green pair in the figure, 36) deviates above the others. This behavior is easily observed in the TDRL graph, and gives us the indication that the design of the pathway for the pins 3 and 6 in the jack is still not perfect. This information helps us in improving the design.

Figure 1: NEXT of the mated Category 6 jack with an OEM Patch Cord.

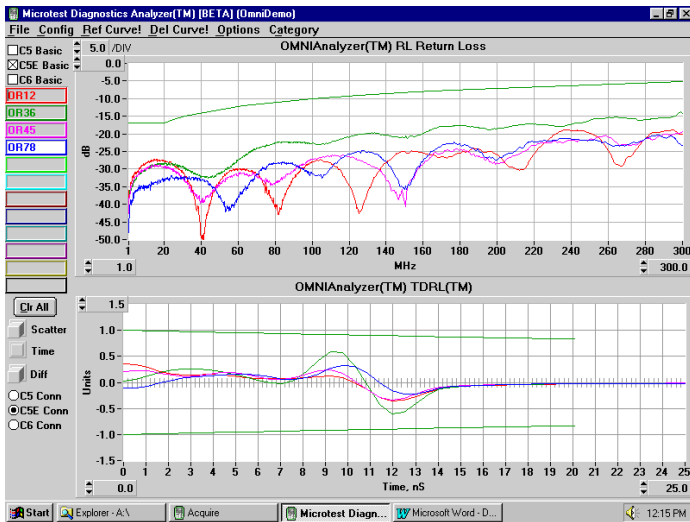


Figure 2: Return Loss for the mated S100 jack.

The OMNIScanner is also a very useful and fast tool for certification of previously installed cabling. It provides to the installer a large library of test standards and cable types.

To avoid the risk of failure when mixing Category 6 connecting hardware from different manufacturers, Microtest, Inc. gives us the opportunity to use our Siemens flexible cords and plugs in conjunction with the supplied test adapters for the OMNIScanner.

One representative graph from the results of the AUTOTEST function, performed over a typical Class E Link, built with components from the Siemens Future ComE product line, is shown in Figure 3 below.

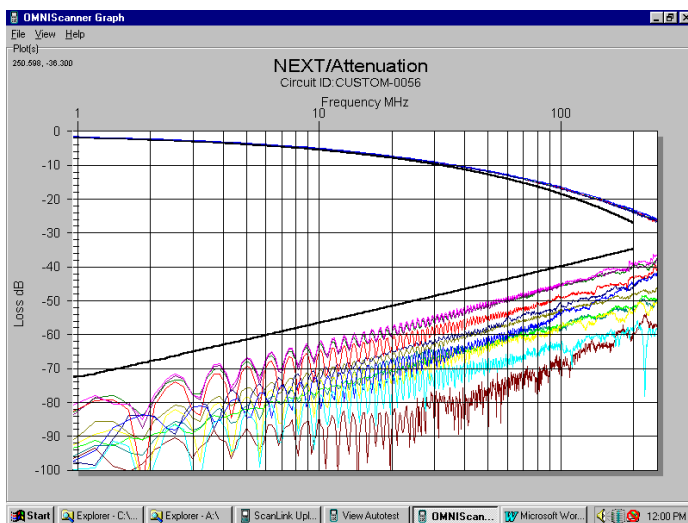


Figure 3: NEXT vs. Attenuation for a Class E Link built with Siemens FutureComE components

Conclusion

The use of (patent pending) TDNXTSM, TDRLSM and S-Bands in conjunction with the OMNIScanner, helps us save a lot of time and money in developing and testing of cabling components. Further, the OMNIScanner has become our most helpful tool for cable fault troubleshooting and exact diagnostics.

SIEMENS

Siemens AG • Hofmannstraße 51 • D-81359 München • TEL: +49 (89) 722 45311 • FAX: +49 (89) 722 44707



MICROTEST®

Microtest, Inc. • 4747 North 22nd Street • Phoenix, Arizona 85016-4708 • TEL: (602) 952-6400 • FAX: (602) 952-6401
 Microtest, Singapore 8 Temasek Boulevard #41-04, Suntec Tower Three, Singapore TEL: +65-836-3220 FAX: +65-836-0211
 Microtest GmbH • Am Soeldnermoos 17 D-85399 • Munich-Hallbergmoos, Germany • TEL: +49 (89) 607 6861 0 • FAX: + 49 (89) 607 6861 1
 Microtest Europe Ltd. • 2A Kingfisher House, Northwood Park, Gatwick Road, Crawley RH102XN • TEL: +44 (0) 1293 894000 • FAX: +44 (0) 1293 894008