

# White Paper

## The Use of System Assured Manufacturers Patch Leads in Warranted Channel Systems



### Overview

I really didn't know where to start when researching this white paper as the initial background work I did in other facets of Manufacturers Warranties, threw up a number of different ideologies.

Some manufacturers insist that the Warranty is only valid with their patch and work areas cords installed, others take a more pragmatic approach, their testing is based on the permanent link and treat the patch lead almost as a necessary 'disposable' item, certainly at the work area.

However, from personal experience I have found that the majority of the 'reported' faults in a cabling system can be traced back to aftermarket and incorrect category patch cords. I have even witnessed a customer who had spent a six figure sum on the installation of a Category 6<sub>A</sub> solution, then install Cat6 patch cords to save themselves a few hundred pounds.

In the long term this will be a major false economy!

It is clear that the performance of the channel is most impacted by noise generated in the area of the channel closest to the end devices equipment; therefore it is critical that patch cords properly support the performance requirements of the entire structured cabling system.

Why when making such a major investment to support critical business applications do some organisations risk continued performance by using un-branded patch cords.

It is important that patch cords have the following design features:

- Mated performance through design with connecting hardware to ensure the maximum cancellation of near-end-crosstalk
- A construction that ensures long-term reliability of the network under day-to-day moves, adds and change conditions
- Certified component performance to match the rest of the system

Investing in high quality patch cords ensures the channel components work together as an end-to-end solution to maximize performance and reliability. Various testing scenarios, not least of which is highlighted below provide quantifiable results to support the importance of high quality patch cords.

### Mechanical Testing

Besides having properly mated patch cords and connectors to ensure maximum performance during initial installation, patch cords also have to be designed to easily handle frequent moves, adds, and changes. Due to the handling that patch cords receive, it is recommended that mechanical stress testing of patch cords to ensure they continue to operate under real-world conditions be carried out. Patch cords should also be mechanically tested for performance after bending in various configurations.

### Conclusions

Patch cords are an integral component impacting the performance of the entire structured cabling system. Investment should be made in patch cords that utilize advanced features to deliver maximum reliability and usability of the network.

As we have seen, some will try and run the risk of saving a few pennies by not using the systems manufacturers patch cords; however before doing so they should take the time to read the freely downloadable 'Copper Cabling Troubleshooting Handbook' from Fluke Networks to see all of the potential pitfalls.

The following will show the test parameters most impacted by poor patch cords. Whilst in the overview the Handbook lists Bad Patch Cords as the number 5 reason, they do go on to clarify that by saying that it would be much higher up the list, as patch cords are not usually present when the installation testing is taking place.



*continued overleaf*

The Test Parameters that can be affected by Bad Patch Cords are:

#### Insertion Loss – (Attenuation)

- Excessive length
- Non-twisted or poor quality patch cables
- High impedance connections
- Inappropriate cable category

#### NEXT and PSNEXT

- Poor twisting at connection points
- Poorly matched plug and jack
- Poor quality patch cords
- Bad connectors
- Bad cable
- Excessive compression caused by plastic cable ties

#### RETURN LOSS

- Patch cord impedance not 100 ohms
- Patch cord handling causing changes in impedance
- Installation practices (untwists or kinks of cable)
- Excessive amount of cable jammed into the Telecom Outlet box
- Bad connector
- Cable impedance not uniform
- Impedance mismatch at junction between patch cable and horizontal cable
- Poorly matched plug and jack

#### RESISTANCE

- Excessive cable length
- Poor connection due to oxidized contacts
- Poor connection due to marginally attached conductors
- Thinner gauge cable
- Incorrect patch cord type

As frequencies increase these factors become even more crucial, so using a patch cord that has not been supplied by the manufacturer of the system may be one false economy too far.

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