White Paper
6-Connector Channel Testing - *is it real?*

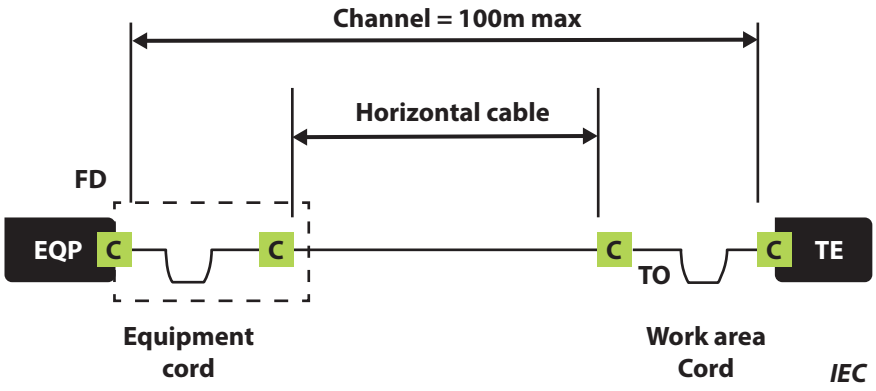
Author: Paul Cave, Technical Manager

Recently, a consultant asked us for 6-Connector Channel Certification for a Class EA Screened System, after one manufacturer had completed this testing and claimed that the results demonstrated that their product was superior. This whitepaper will scrutinise 6-Connector Channel Testing as an appropriate certification method in the real world, with a view to debunking the myth that this product is in fact superior.

To fully appreciate this point, we must start by understanding the Horizontal Cabling models described in ISO 11801-2 and EN50173-2. Both are the same and cover four basic models:

1. Interconnect to Telecom Outlet Model

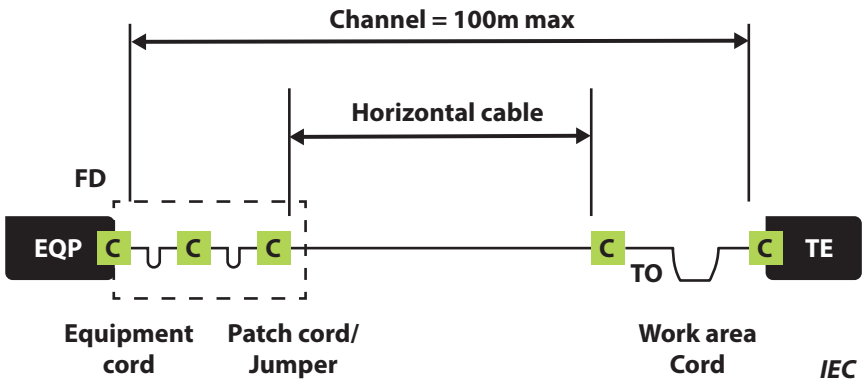
Extracted from ISO 11801



This model has two connections

2. Cross-Connect to Telecom Outlet Model

Extracted from ISO 11801

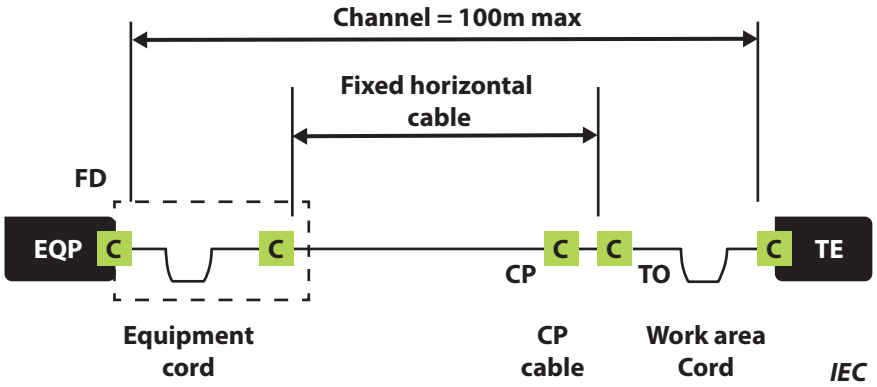


This model has two patch panels at the equipment end and has three connections

continued overleaf

3. Interconnect to Consolidation Point to Telecom Outlet Model

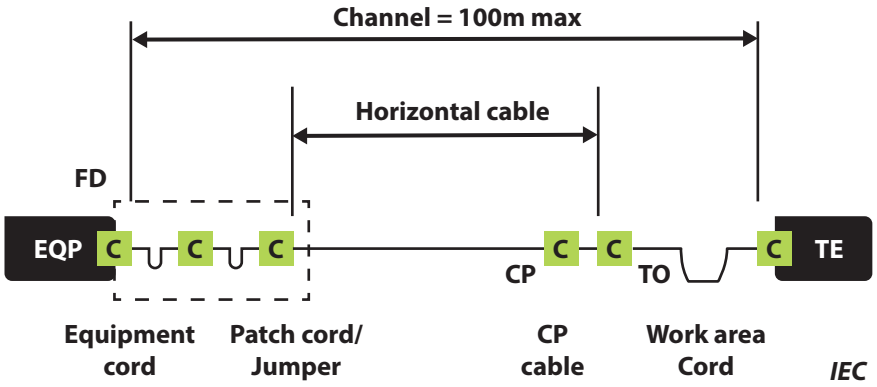
Extracted from ISO 11801



This model has three connections

4. Cross-Connect to Consolidation Point to Telecom Outlet Model

Extracted from ISO 11801



This model has four connections

There are a few additional points raised in the standards that are worth highlighting:

1. The physical length of the channel shall not exceed 100m
2. The physical length of the horizontal cable shall not exceed 90m. When the total length of patch, equipment and work area cords exceeds 10m, the allowed physical length of the horizontal cable shall be reduced according to Table 3
3. A consolidation point shall be located so that there is at least 15m from it to the Floor Distributor
4. Where a multi-user Telecom Outlet assembly is used, the length of the work area cord should not exceed 20m
5. The length of patch cords/jumper cables should not exceed 5m

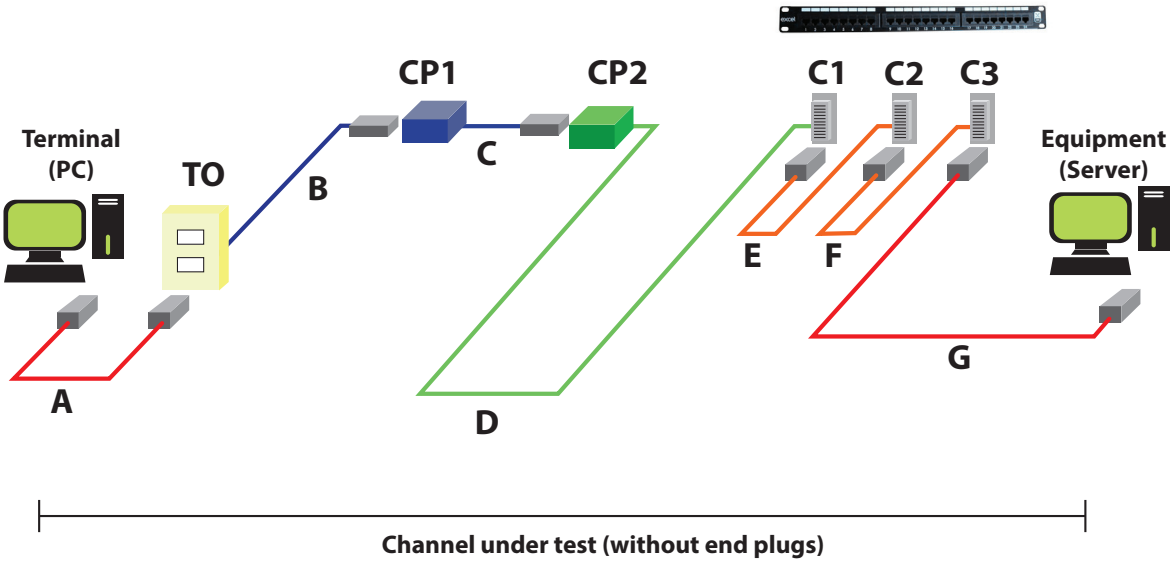
Note: Table 3 provides the channel length derating equations that cover attenuation due to the use of stranded conductors used in patch leads, as well as that caused by higher temperatures. At no point do they outline additional connections.

To highlight this the most important wording within the clauses is:

"For the purposes of testing, the channel excludes the connections at the application-specific equipment."

Therefore, you ignore the two connections at either end of the Channel, according to the standards they only outline a maximum of four connections.

Whilst there is nothing in the standards that says you cannot create a channel with more connections - as in the drawing below - the question is, does it relate to a real-world application?



To achieve a 6-connector channel while ignoring the equipment connections you would need to have three patch panels and two consolidation points. Whilst I can understand that there might be a rare occurrence where you may have to link to another building using a short run of the external cable, thereby needing two consolidation points or possibly a localised patching field within a data centre as well as the main patching field, it would still only normally result in a 5-connector channel.

Testing

For one of the major issues with standard Permanent Link and 4-Connector Channel Testing, this can be recreated in the field using a standard Field Tester such as a Fluke DSX or Lantek III. It is not possible to recreate a 6–Connector Channel test, you would have to test to 4-Connector.

It should also be noted that every time you add a connection to the channel you are adding a margin of error.

As an example, when you add a consolidation point to a Class EA Permanent Link, the test limit changes from PL2 to PL3, with the latter being relaxed to account for the connection. Channel Test Limits are relaxed compared to the Permanent Link to allow for the higher attenuation of the patch leads.

The whole topic of Channel Testing is also questionable and only really of use when trouble- shooting. It is a one-off test combining fixed element (Permanent Link) and the moveable (Patch Leads). Any movement of a patch lead or user lead changes and invalidates the Channel Test.

Conclusions

It is clear from this that a 6-Connector Channel does not represent a real-world compliant installation. Furthermore, in the Enterprise space, if you must use a 6-Connector there is something wrong with the original design as it represents a compromise with an increased element of risk due to adding the extra unnecessary connections.

Therefore, it is recommended to stay with the 3- or 4-Connector Channel or more effectively test to Permanent Link if you want to get the maximum from your system.

European Headquarters
Excel House
Junction Six Industrial Park
Electric Avenue
Birmingham B6 7JJ
England

T: +44 (0) 121 326 7557
E: sales@excel-networking.com

Mayflex MEA DMCC
Office 22A/B
AU (Gold) Tower
Cluster I
Jumeirah Lake Towers (JLT)
Dubai
United Arab Emirates
PO Box 293695

T: +971 4 421 4352
E: mesales@mayflex.com

www.excel-networking.com