Contribution to IEEE 802.3af power over MDI task group

Subject passive performance requirements for mid-span power insertion device.

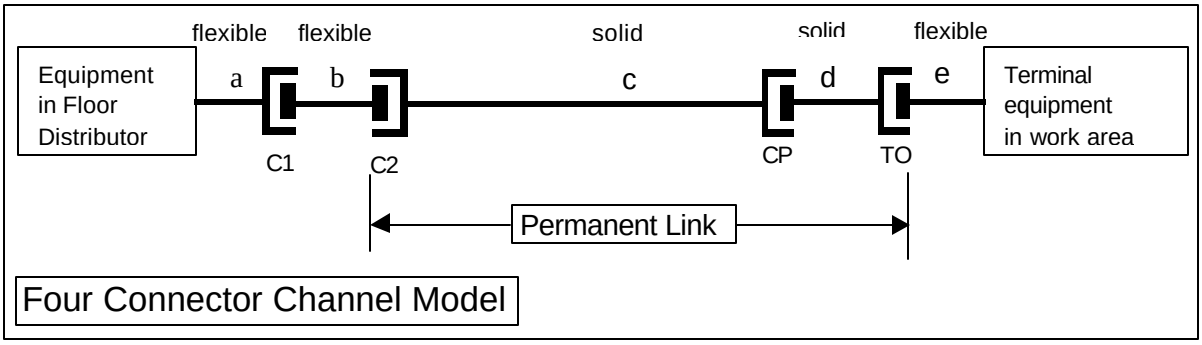
Introduction

Unless the mid-span insertion device includes active repeater electronics it appears as a passive device inserted into the channel. Such a device must conform to component requirements of current standards for category 5 channels. To determine which component requirements are applicable, we must consider how the power sourcing device is inserted into the channel. As it turns out, there are primarily two ways that the power device can be inserted into a channel without disrupting the intent of the cabling standards.

Permanent Link definition

The permanent link is defined as the permanently installed portion of the cabling. It consists of one connector in the equipment closet, up to 90 m of horizontal cable, a consolidation point connector located up to 20 m in from the far end of the horizontal cable, and a telecommunications outlet connector at the work area. The intent of the permanent link is that the components are standards compliant, they are permanently installed, and there are no devices installed within the permanent link (behind the wall so to speak) that restrict the application. Thus, termination resistors, diodes, crossovers, and other devices that would limit the usability of the permanent link for different applications or upgrading at a future date are not permitted.

It violates the cabling standards therefore to install the PSE as a permanent part of the cabling system within the permanent link.



Four Connector Channel Model

Channel definition

The channel adds to the permanent link a patch cord and 2nd connector in the equipment closet, and equipment cords at both ends, the work area and the equipment closet. The channel definition allows for a full cross-connect in the equipment closet. Depending on how this is implemented, the equipment cord may be a modular double-ended cord, a modular single ended cord, or perhaps a 25 pair cable with connectors at both ends.

While the channel definition allows for a full cross-connect, many installations forego the second connector in the equipment room and connect directly to the active equipment directly from the permanent link connector using an equipment cord. If the active equipment and patch panels use 8 position modular jacks, the equipment cord is the same as a modular patch cord. This topology is called an interconnect configuration.

Mid-span power device

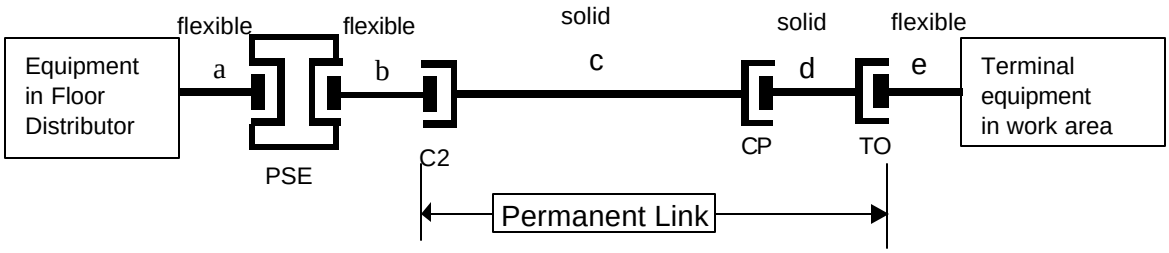
The mid-span power device may then take two forms and not violate channel topology:

1: As the second cross-connect connector either replacing one if already used (existing cross-connect configuration). Or adding the second cross-connect connector (existing interconnect configuration)

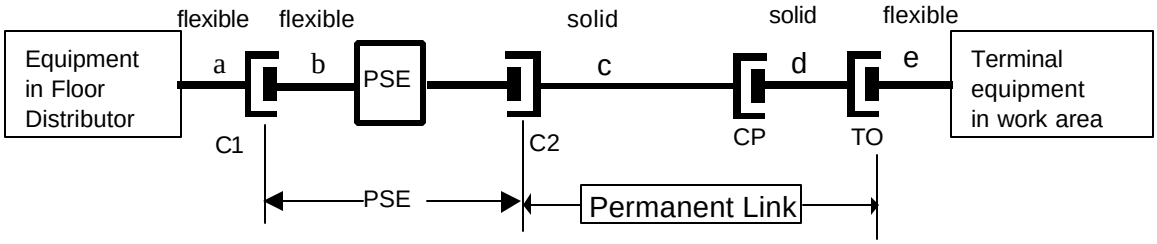
2: As an equipment cord at either end of the channel, or a patch cord in the cross-connect.

In case 1, the mid-span power device would typically have either two modular jacks as input and output, or have one modular jack and one IDC connector, similar to an existing patch panel.

In case 2, the mid-span power device would have two cords exiting the power device with modular plugs attached.



PSE device topology 1



PSE device topology 2

Other cases:

Of course, there are other combinations possible, for instance a modular jack for output and a cable with modular plug for input to the PSE, but the problem will be in determining what kind of device this represents and defining appropriate test limits and test configurations.

Performance requirements

If the PSE resembles the topology of 1 above, the device shall meet the requirements of ANSI/TIA/EIA-568-B.2 section 5, connecting hardware for UTP cabling. The PSE device shall be considered equivalent to one (1) mated connector. Performance requirements shall be measured without power applied to the device.

If the PSE resembles the topology of 2 above, the device shall meet the requirements of ANSI/TIA/EIA-568-B.2 section 6, UTP patch cords and cross-connect jumpers. The PSE device

shall be considered equivalent to one (1) patch cord or equipment cord. Performance requirements shall be measured without power applied to the device.

For both cases 1 and 2 above, the PSE shall meet the emissions requirements of FCC part 15 class B tested with the power on and under full load conditions (350 mA current supplied per port) as defined by the power sourcing capability of the PSE stated by the manufacturer. For this test, the PSE shall have all ports terminated to cables of not less than TBD m (TBD ft) in length, with appropriate connectors and impedance matching loads.

Other configurations of the PSE are outside of the scope of the standard. In such cases, it is the responsibility of the manufacturer to devise test limits and configurations that define the PSE according to the Permanent link and channel topologies described above.

Notes

The wording of this contribution is somewhat informal in terms of the topology definition and discussion. The wording of the performance requirements is formal so that it may form the basis for wording in the standard.

I have not included the international equivalents for the quoted standards. In many cases, the TIA requirements are more detailed than the European counterparts.

There are currently more detailed requirements for connecting hardware than for patch cords, for instance, there is no current specification for patch cord insertion loss or ELFEXT. We may wish to request TIA develop these requirements, or determine them ourselves.

TIA 568-B.2 is currently a draft document. It is anticipated to be published by first or second quarter 2001.