

Scratching the surface

Nick Taylor of Networks Centre explains the various reasons to consider using pre-terminated cabling and when it might not be the most suitable solution

▶ Pre-terminated cabling is often favoured due to its ability to significantly reduce on-site installation time. When customers can provide accurate cable lengths and there's ample lead time, pre-terminated solutions offer a substantial time-saving advantage. This is particularly beneficial for projects with tight deadlines, where pre-terminated cabling might be the only viable option. Beyond installation time, consider the other potential savings such as plant hire and project management.

HORSES FOR COURSES

It's important to weigh these benefits against the potential drawbacks. In situations where cable pathway locations are uncertain or lead times short, field terminated cabling might be more suitable. This is especially common in office environments, where layout changes may occur.

For smaller deployments like optical fibre backbones for an office environment, ordering slightly longer pre-terminated assemblies can accommodate pathway adjustments without significant issues, as there would be minimal slack management

required. However, in larger projects, too much slack can be a big issue, so lengths must be accurate. A hybrid approach might be considered, where assemblies are made double length, tested, cut to size on-site and the blunt end terminated.

TOP SPEED

Multi-fibre connectors like multi-fibre push-on (MPO) and their very small form factor (VSFF) equivalents such as SN-MT and MMC fall into this category and these are the connectors required to support the highest speeds. High speeds can be achieved through a combination of factors. More fibres can transmit more data simultaneously, efficient encoding schemes optimise data transmission and multiplexing combines multiple data streams on to a single channel.



1) Standard/Uniform Key to Angle



2) Non-Standard/Uniform Key to Angle

Some AI deployments require >5,000 fibres per rack, so using VSFF connectors becomes essential. Meanwhile, some VSFF

array connectors can take as little as a third of the rack space compared to an MPO.

GREATER ASSURANCE

Manufacturing defects that reach the supply chain are very rare from manufacturers of high-quality systems, as they invest significant money into equipment to test at every step along the process. However, it's still possible to find defects that would not be discovered during factory tests and would only show-up after all components are connected and a certification test is performed. This is especially true when it comes to lower cost systems.

By buying a pre-terminated system from a manufacturer of high-quality components, this risk is virtually eliminated. Certification testing to the required lengths has already been undertaken, although it's recommended to retest once the cabling has been installed in its final position.

FLIP OUT

Most customers want a 'flip' in the channel so they can use standard patch cords (as per BS EN 50174-1), whilst others prefer to have a 'straight' channel and use one non-standard patch cord. When channels

more difficult. Additionally, different colour codes and polarity control methods, such as symmetrical versus reverse-pair, are used in different countries to create a 'pair-flip'.

Whilst it's possible to provide details on the polarity control method to be used by the installer for a field terminated system, this is not always a simple thing to verify, so some clients prefer to specify a pre-terminated array-based system, such as MPO cables and MPO-LC transition cassettes, and to specify a polarity method.

Annex C of EN 50174-1 currently calls for all cables and adaptors to be key-up/key-up (Method B) which, when compared to Method A and C, provides the simplest and most consistent method to provide a pair-flip for both serial/duplex and parallel circuits. The issue with Method B is that the key-up/key-up adaptors do not support angled polished connectors unless the angle on the Type B trunk cables is rotated 180° relative to the key, as shown on 2 below.

Whilst the MPO connector standard allows for 2, it's not a widely used approach, which limits compatibility and narrows the choice of manufacturer, so is best avoided. Perhaps the better solution is to swap the 2xType B key-up/key-up adaptors for 2xType A key-up/key-down adaptors

End Ferrule requiring a Key-Up/Key-Up MPO Adaptor (*shown in Black*)

Angled Ferrule requiring a Key-Up/Key-Down MPO Adaptor (*shown in Charcoal Grey*)

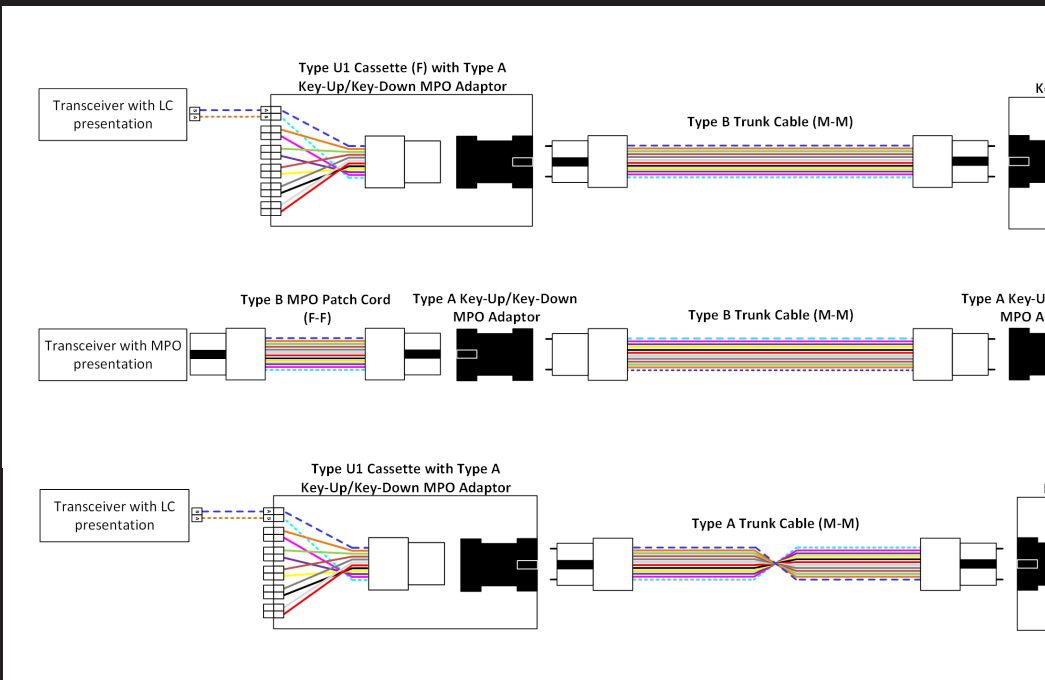
become more complex with the addition of switch harnesses and extensions, maintaining the desired polarity becomes

(previously only used for Method A and C systems), as these can accommodate flat and angled polished connectors.

'Pre-terminated systems provide better control over polarity, minimising the risk of field errors, while pre-cut lengths simplify stock management, reduce waste and eliminate the need for adjustments on-site.'

A single flip of any component (trunk cable, patch cord or adaptor) changes the

updated to reflect the U1 and U2 wiring configurations shown in ANSI/TIA-568.3-E



polarity (from straight to flipped or vice versa) but two flips cancel each other out.

You will note above that the transition cassettes used are Type U1. Although the most widely use of Type U cassettes is with Type B MPO trunk cables to achieve a pair-flip, these same cassettes could be used with Type A trunk cables to achieve a 'straight' link where a non-standard A-A patch cord would need to be used at one end. However, EN50174-1 has not yet been

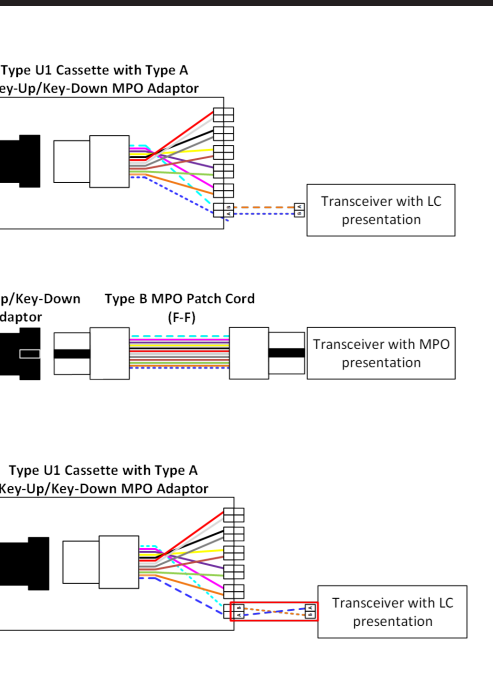
It should be noted that come manufacturers use MPOs where the polarity and gender can be changed in the field. Using such products allows for the manufacturer to comply with BS EN 50174-1 by keeping the pins hidden and protected inside the transition cassettes.

Regarding stock management, using a standard system for all countries, other than the fire rating of the cable used, makes it easier for manufacturers and

distributors to hold the required stock. They can also, if necessary, ship goods between warehouses to support projects.

TAKING THE ADVANTAGE

Choosing pre-terminated cabling offers advantages beyond just on-site time savings. Multi-fibre connectors require pre-termination due to their complexity,



making this method essential for certain installations. It also ensures uniformity across different locations, maintaining consistent product quality and installation standards. Similarly, pre-terminated systems provide better control over polarity, minimising the risk of field errors, while pre-cut lengths simplify stock management, reduce waste and eliminate the need for adjustments on-site. ■



NICK TAYLOR

Nick Taylor started in this industry in 1997, holding various roles and spending most of his career working for installers, as well as six years at a leading manufacturer. Since January 2023, he has been the technical sales director at Networks Centre. He's a BICSI Registered Communications Distribution Designer (RCDD), an active member of various industry standards bodies and many customers see him as a trusted advisor to help solve their issues.