Module 7 - Copper Connectivity

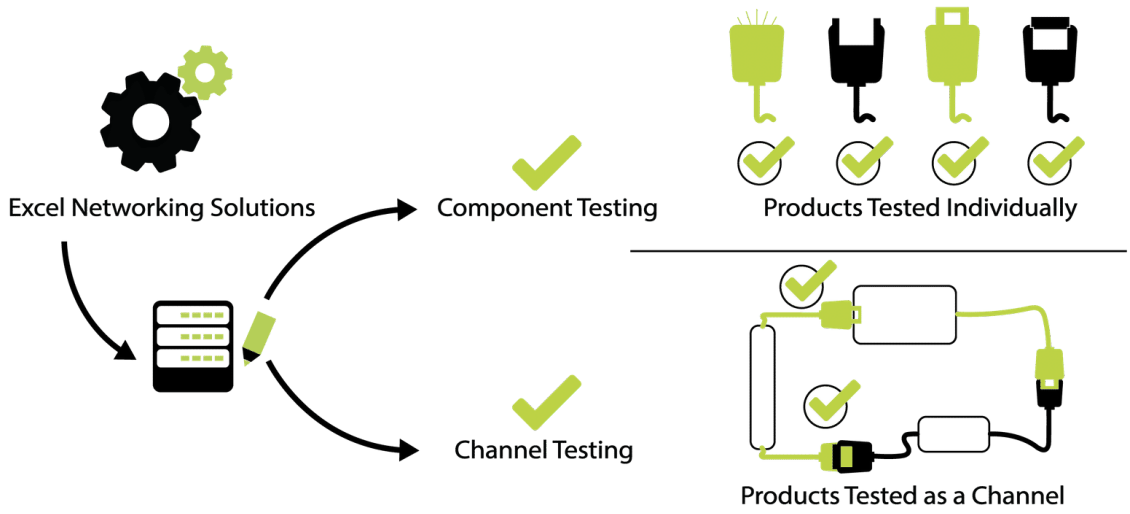
- Third Party Verification
- Category 6
- Category 6A
- Installation Guidelines

Third Party Verification

Excel Networking Solutions has the widest range of products that are verified by a third party at Independent Test Houses. We also have the **largest** number of verification certificates with Force Technology of any other manufacturer.

Force Technology
View Certificates

3P
View Certificates



Excel Category 6 and Category 6A systems are amongst a handful in the industry with **both channel and component** verification.

Find out more

Further information about channel versus component verification is available on the Excel website.

GO TO WEBSITE

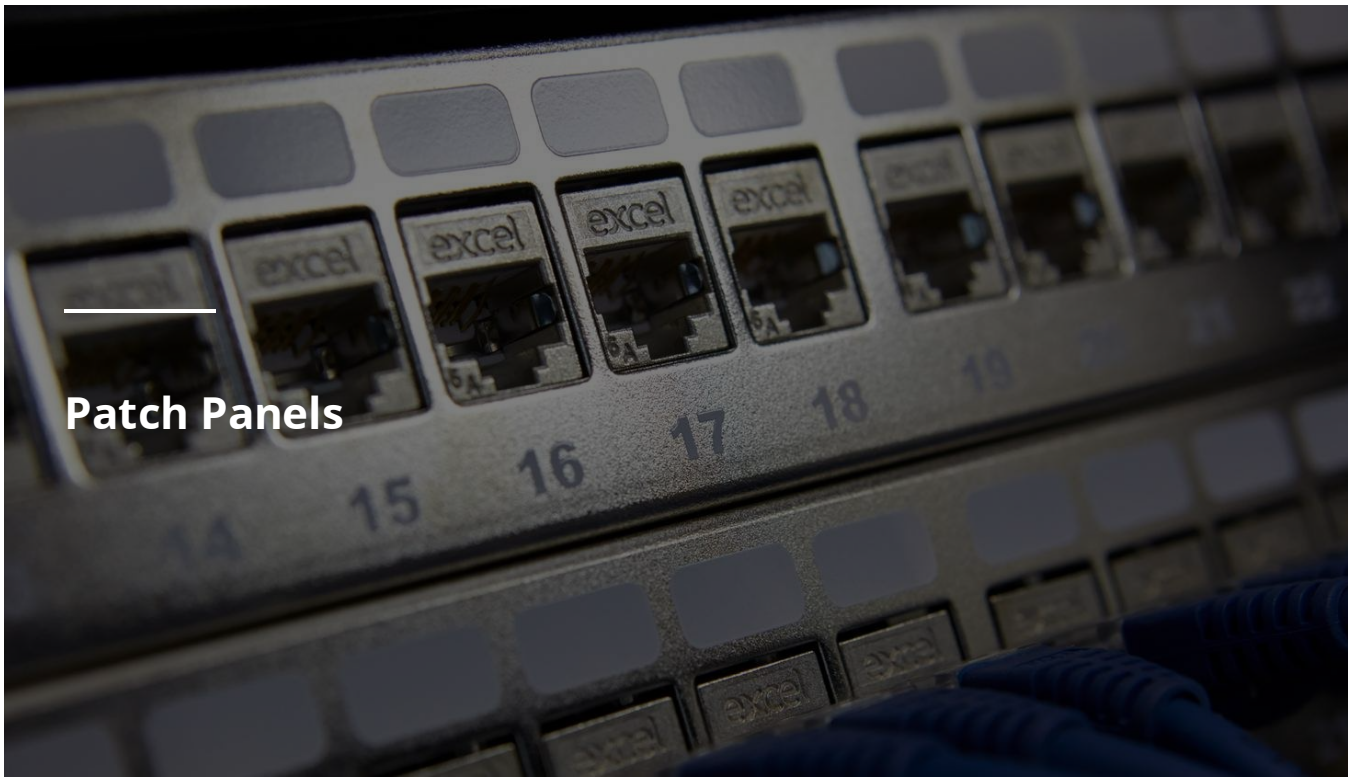
Category 6

Category 6 versus Category 5e

- Better margins
- New applications
- Standards
- Gives better application headroom in challenging installs
- Improved performance in relation to the heating impact for applications such as 4PPoE
- Category 5e has been effectively retired by both Cenelec and ISO/IEC in regards to ***commercial*** installations

6.3.2.2 Requirements | *6.3.2.2.2 Horizontal cabling*

Horizontal balanced cabling shall provide Class E or better channel performance as specified in ISO/IEC 11801-1:2017, 6.3. Class EA or better performance is recommended for support of applications with data rates exceeding one gigabit per second.



Patch Panels

- Wide Range
  - Screened and Unscreened
  - Unloaded frames for Keystone Jacks
  - PCB – Angled and Flat
  - 16, 24 & 48 port

Excel has a very wide range of patch panel options, including 0.5U and unloaded frame for angled keystone jack 100-213.

The correct dressing of patch panels is important as it can impact on performance. Each cable must be attached to the management bar individually with the ties provided.

The patch panels are one area the end-user sees and they will judge your overall installation based upon how neat and tidy they look.



CONTINUE





Unscreened Modules

- These are available in both Euromod (50 x 25mm) and 6c (37 x 22mm) sizes as well as standard and low profile - therefore it's important you get the correct mounting hardware.
    - 6c are usually used in floor boxes and GOP boxes, whilst Euromod are used with faceplates and backboxes.

Take care to route the cable in the right direction to ensure the correct bend radii is maintained. *For assistance with bend radii, you can revisit **Module 6** of this course before proceeding with the assessment.*

CONTINUE





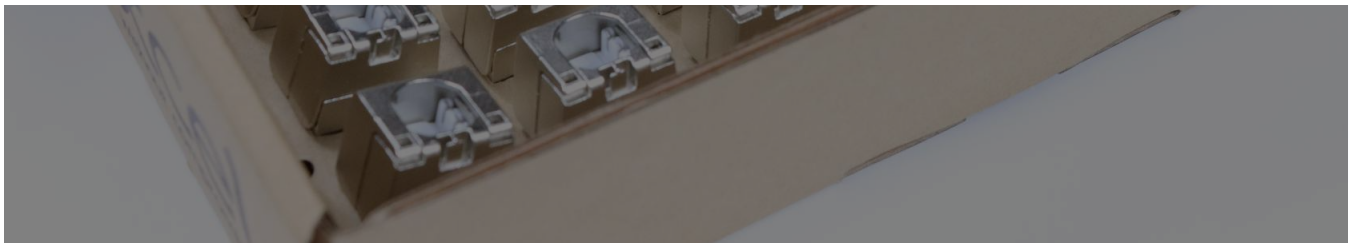
Unscreened Keystone Jacks

- Both toolless and punch-down (also available in blue, red and green) available
    - *The toolless keystone jacks typically have a termination time of less than 2 minutes*
- Used with shuttered modules and faceplates
- Available with black front for patch panels and white for the outlet end
- The angled jack is used with a specific unloaded patch panel frame.

CONTINUE



Screened Keystone Jacks



- Available as a toolless keystone jack
- A termination time of around 3 minutes

CONTINUE



Unscreened Patch Leads

- Available in a wide range of lengths, from 0.2m up to 30m
- Available in 12 colours (not all lengths)
- A lockable version is available in grey from 0.5m up to 5m

CONTINUE



Screened Patch Leads

- F/UTP Screened Patch Leads
- Available in 5 Colours
    - Grey, Blue, Red, Green & Yellow
- Length from 0.5m up to 7m (not all colours available in all lengths)

Please remember the category of the patch lead can dictate the category of the entire system.

Category 6A



- For performance purposes, it is best to use unloaded frames with individual keystone jacks
- It is possible when using unloaded frames to insert the exact number of outlets and fill the remainder with blanks.

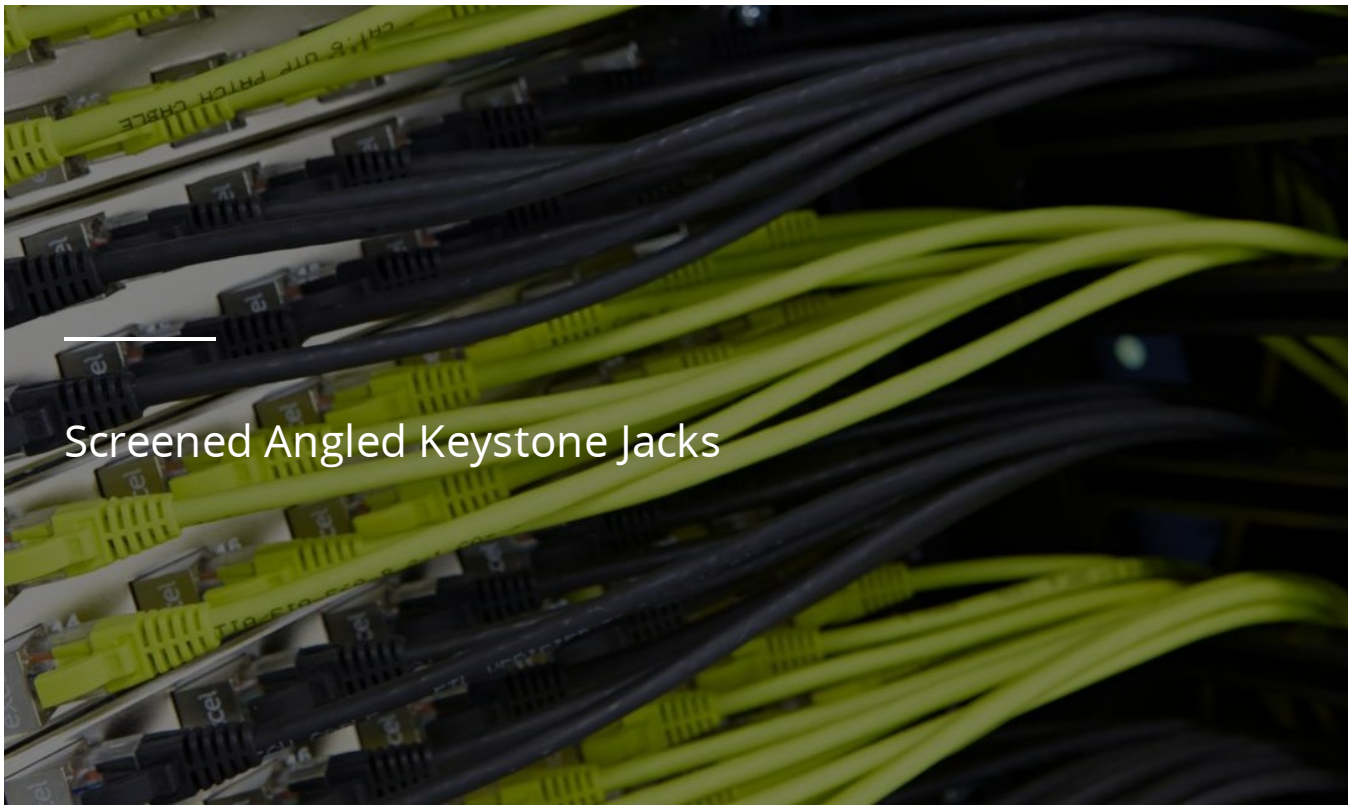
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Screened Keystone Jacks

- Low Profile, standard and angled
- 3rd Component Verified
- Tested for 4PPoE
- Low profile 100-181 is the smallest third party verified component available, at 28.3mm
- Typically terminated in less than 3mins
- All are tested for performance compliance with ISO 11801 as well as ISO/IEC 60512-99-2 the latter is the test for un-mating under electrical load of up to 2A. The latter is important as when disconnecting a patch lead when 4PPoE is present it can result in damage to the contacts, shortening the life of the product

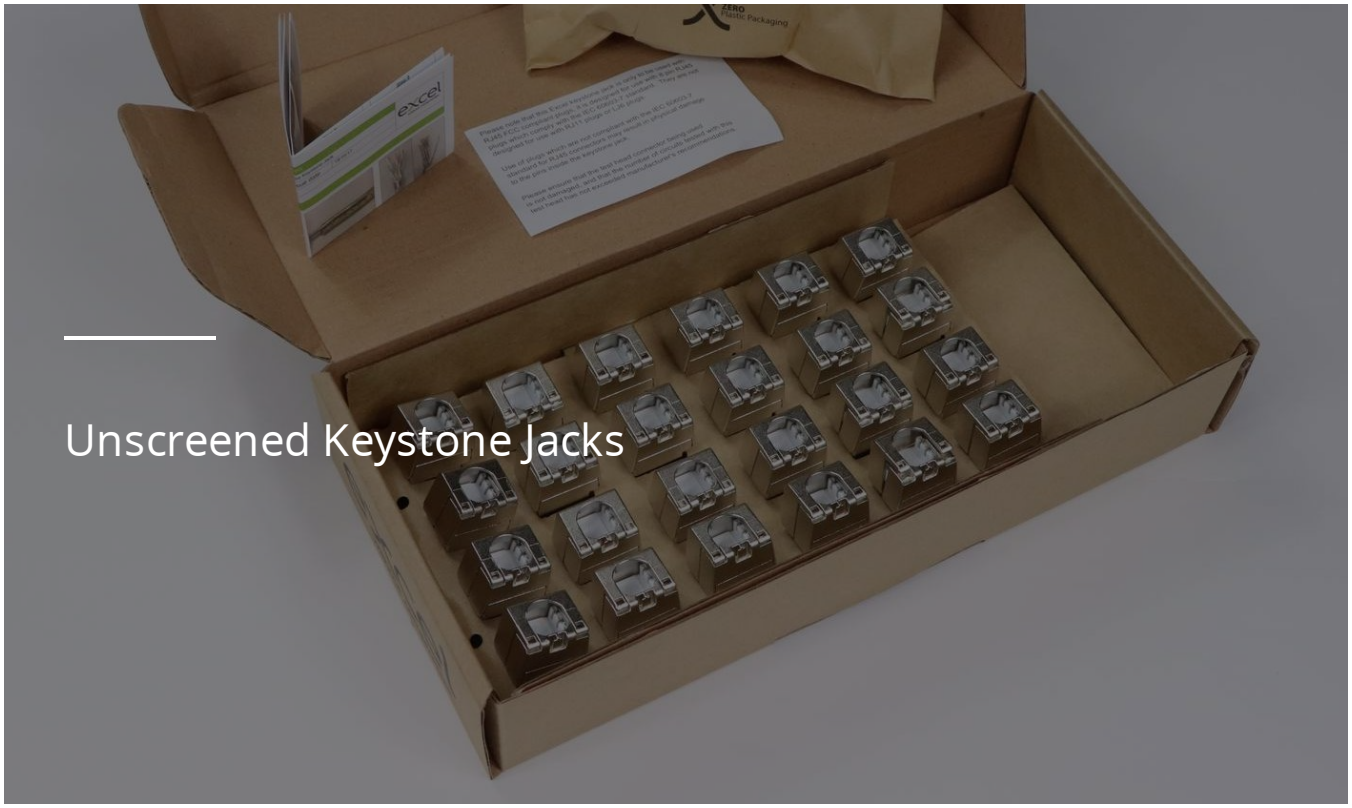
CONTINUE



Screened Angled Keystone Jacks

- Ideal for High Density
  - 180° rear exit
  - 45° front presentation
  - Specific mounting frame
  - Reduced depth required at front
- The most popular option is to use the angled keystone jack at the patch panel and low profile keystone jacks at the outlet. This approach can increase the capacity in the patching field by as much as 50%.

CONTINUE



Unscreened Keystone Jacks

- Low profile
- Available in black for panel and white for outlet
- Metal rear butterfly
- 100-182 has the same dimensions as the 100-181 screened jack and also has independent 3rd party verification

CONTINUE

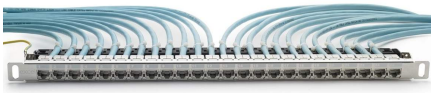
High Density Installations



Angled V Panels



Angled Jack Panels



0.5U unloaded panels
Popular for saving space combined with the low profile jack in server and switch cabinets

Installation Guidelines



- Downward-facing angled shuttered modules are required
- Available in 6c and Euromod sizes
- Ensuring the correct direction of entry will reduce the size of backbox required



Wrong practice

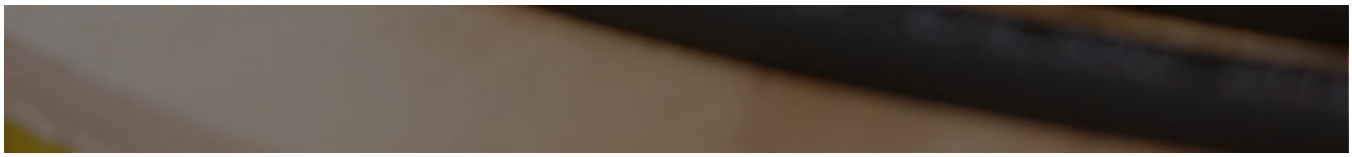
The backbox is too small and direction of entry for the cable means the bend radii is compromised.

A back box depth chart can be found in the Installation Guidelines chapter of the Excel Encyclopaedia.

Sometimes ‘more is less’, by having a deeper box and creating a loop of cable inside it is possible to enter from the bottom without compromising the bend radii. If in doubt create a mock up first, it could save a lot of wasted time on-site.



Floor Boxes





350-601

Excel 3-Compartment Floor Box (including 1 Double Switched Power Socket)

- Termination in floor-boxes should be straightforward however it is commonly done incorrectly

- It all depends on the orientation of the floor box and its lid
- Cable entry should come from the side on which the lid is hinged
- An angled 6c shuttered module should be mounted in a flat plate
- The patch lead is plugged in and exits in the direction of the open side, using the red retaining rings shown here

During site audits the reverse has been found purely due to a drawing. It is relatively easy to rectify by reversing the lid, which is usually a simple task. Getting it wrong compromises the bend radii of the cable and the patch lead. It will put strain on the outlet itself.



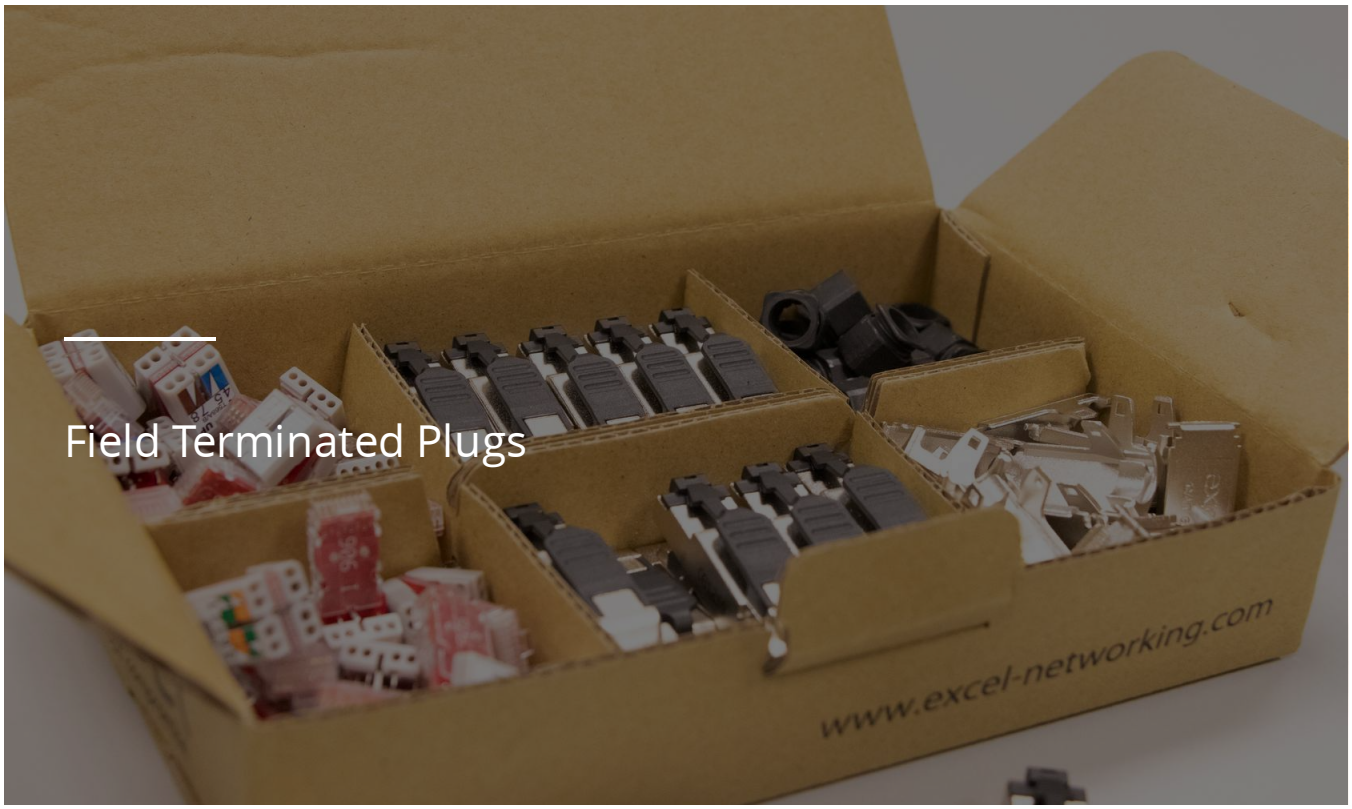
Very popular for commercial installations in offices with raised floors is the use of GOP (Grid Outlet Position) boxes.

They provide the flexibility during office configuration changes as they are typically fitted at the end of 5m of flexible conduit that is fixed at the other end to an anchor plate.

They can then be either moved under the raised floor to a new location or pulled up through a grommet and fixed underneath the desk.

They are available from 2 to 12 outlet versions and come with a number of blanks.

They should be used with angled shuttered modules which are inserted with the shutter facing in the opposite direction to the cable entry to ensure that the bend radii of the cable is not compromised.



All field terminated plugs from Excel Networking are covered by the 25 year warranty.



100-117
Excel FAST Category 6 Unscreened – Crimp Style



100-140
Category 6A Screened - Toolless



100-118-100
Bulk Pack Category 6A Screened – Crimp Style

With 100-117 it is recommended that the specific crimp tool is used to ensure that the conductors are cut off flush.