



EXCEL

EXCELLENCE IN NETWORKING

Excel – The future of Structured Cabling

Introduction

The way in which today's businesses operate has changed significantly over recent years. The speed and relentlessness of this change means we increasingly rely on the supply and availability of fast and accurate information and efficient communication between colleagues and the outside world. We constantly expect more from our computer networks and as a result, our investment in powerful computers, e-commerce and faster networking equipment has never been higher. Our needs and applications change as new technologies are introduced with increasing use of the Internet, Intranets, Email and video conferencing. Gigabit Ethernet over copper and fibre is now a reality and we're now looking to the future and the implementation of new protocols to increase the speed and performance even further.

Consider this and then the fact that we often treat arguably the most important component of these modern, business critical networks as an afterthought.

Cabling

Your network is only as good as its weakest link.

If your cabling cannot handle the increased demands placed upon it, your investment is wasted and your business suffers, in fact, in excess of 50% of network failures are due to problems with the cabling.

The life expectancy of your cabling infrastructure is far greater than that of any of the hardware that will connect to it.

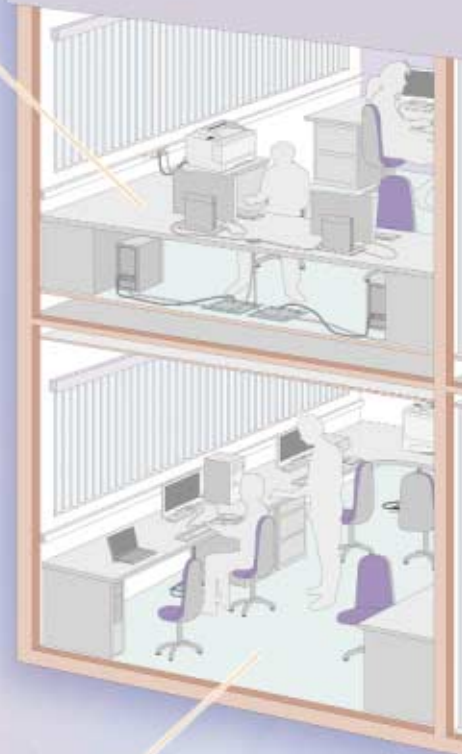
You must therefore plan well and think ahead when deciding upon your choice of cabling.

A well designed, correctly installed, standards compliant structured cabling system, backed by a comprehensive warranty programme, is the best way of protecting this investment and allowing for future needs.

The purpose of this brochure is to highlight the benefits available to your business by installing such a system. We will also look at the developing cabling standards and demonstrate the features available by specifying Excel for your next structured cabling installation.

Upstairs Office

- Excel Cat 5e and Cat 6 Cabling
- Excel Fibre to the desk
- Excel Dado Trunking
- Excel Floor Boxes



Downstairs Office

- Excel Cat 5e and Cat 6 Cabling
- Excel Trunking

Upstairs Comms Room

- Excel Cabinets
- Excel Cat 5e and Cat 6 Cabling
- Excel Floor Boxes

Reception

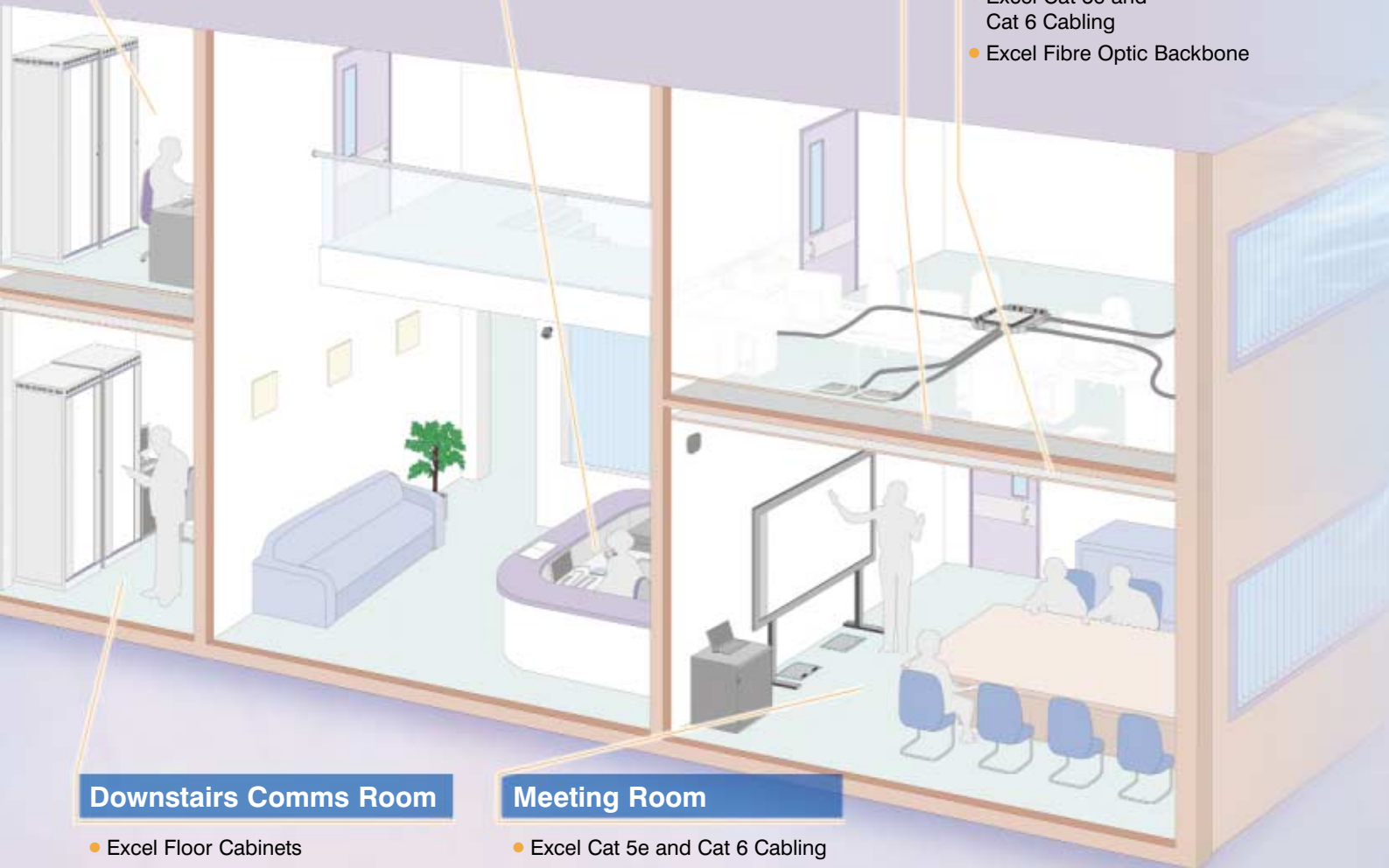
- Excel Trunking
- Excel Voice Products

False Floors

- Excel Cat 5e and Cat 6 Cabling
- Excel Floor Boxes

False Ceiling

- Excel Cat 5e and Cat 6 Cabling
- Excel Fibre Optic Backbone



Downstairs Comms Room

- Excel Floor Cabinets
- Excel Wall Cabinet
- Excel Connection Boxes

Meeting Room

- Excel Cat 5e and Cat 6 Cabling
- Excel Trunking
- Excel Floor Boxes

Changing standards in a c

The standards which dictate performance levels of structured cabling systems are published by the International Standards Organisation – ISO and the American based Electronic Industries Association/ Telecommunications Industry Association – the EIA/TIA. As the performance needs of the users have developed and increased so have the cabling standards designed to support them.

Initially Level 3 offered all of the above benefits at relatively low frequencies of up to 10Mhz. This was superseded by Level 4, which in turn became outdated when Level 5 was introduced, specifying performance characteristics of up to 100Mhz. Various amendments to the standard led to the release of Category 5e and then in June 2002, Category 6 was ratified increasing the bandwidth speeds to 250MHz.

Category 5e – Class D

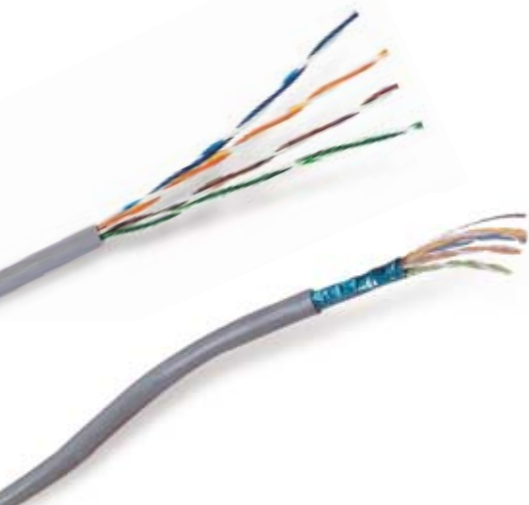
In 2000 we saw the ratification and publication of a new standard Category 5e, the 'e' meaning enhanced. Developed jointly by both the ISO and EIA/TIA Category 5e was designed specifically for protocols such as Gigabit Ethernet and other full duplex applications, which will inevitably appear in future years. Although the actual bandwidth – 100Mhz – is identical to Category 5, there were a number of important new performance parameters contained within this specification. These include Equal Level Far End Cross Talk (EL-FEXT) Return Loss and various Power Sum measurements.

Category 5e has been widely adopted throughout the market and is backwards compatible with all previous classes of performance. This means the accidental use of a Category 5 patch cord will not cause your network to crash and you're guaranteed to maintain at least Category 5 performance. Finally and perhaps most significantly there is a real, available application designed for Category 5e Gigabit Ethernet.

Introduction to structured cabling

The principal of Structured Cabling was introduced into the UK in the late eighties, early nineties with the launch of what was known at that time as Level 3 cable. The idea – with its origins in America – was that you could replace existing, traditional cable types such as expensive, bulky, protocol specific coaxial with a low cost, lightweight, easy to install 4 pair unshielded twisted pair cable. As well as the change in cable type the design of cable systems altered. The term 'flood wiring' became common place as customers installed dedicated cable runs for each device and installed more outlets than initially required to allow for future needs and growth.

A major benefit of this new cabling technology was the fact that it was protocol independent. Any equipment which operated below the cable's maximum working frequency could be connected and function as normal, this could include computers, telephones, printers, faxes etc. The freedom and flexibility which this concept introduced allowed users to effect moves, changes and system upgrades in a time and at a cost, they could only previously dream of.



Changing world

Category 6 – Class E

In June 2002 Category 6 was ratified. Category 6 offers bandwidths of 250MHz and provides a truly future proof cabling system that will run Gigabit Ethernet and beyond. Due to the strict requirements set out in this Class E standard and to enable the performance to be more than doubled from the previous Class D standard, manufacturers have had to radically redesign each element of the structured cabling system to ensure full backward compatibility and interoperability.

Category 7 – Class F

In what many believe will be the final commercial copper structured cabling standard, proposals are being made for a specification based around a screened twisted pair cable with a maximum operating bandwidth of 750MHz. This standard is only being developed by ISO. Due to the bulky nature of the proposed cable and the likely cost implications coupled with limited application need we do not expect Category 7 to be widely adopted in the UK.

Category 8

The Category 8 standard is currently being developed primarily for the SOHO market and will be based on a 4 pair individually and overall screened cable and a new non RJ45 style connector. The system will carry all of the voice and data into a house or small office including the telephone, TV, Video, DVD, computer and satellite, potentially on just one cable run. Category 8 is particularly of interest due to the fact that broadband multimedia services are now becoming more widespread and the take up will increase dramatically over the next few years.

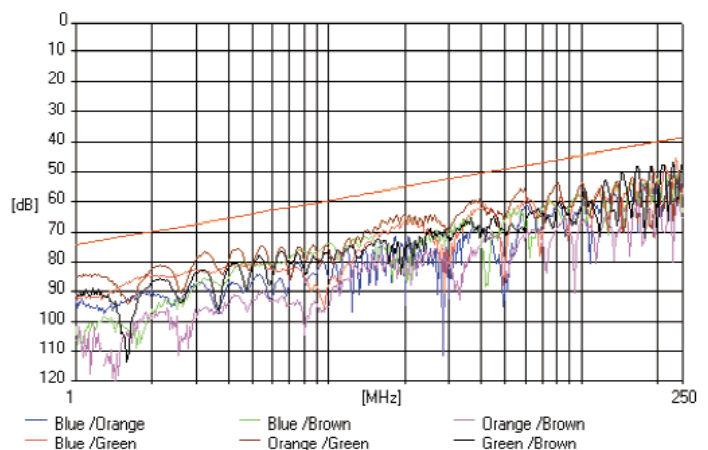
Copper cabling – product performance



Installing Excel ensures standards compliant performance based cabling. Each Excel product is Power Sum Compliant. Each product is manufactured under strict quality control procedures in accordance with ISO9001:2000 and designed to exceed the requirements of the relevant standard.

This assurance is further emphasised by the third party, independent approval awarded to the Excel Category 5e and 6 product ranges by Europe's largest test house Delta. This verification has been issued after testing to the relevant standards – see diagram below.

Diagram 1: Typical Excel link near end cross talk (Next) Category 6 Class E



Source: Delta



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– an introduction

The Excel range of structured cabling products and associated components first appeared back in 1997 with the launch of Category 5 cables and patch leads. The Excel brand was developed by Mayflex, a leading distributor within the networking industry, which from its inception in 1917 has built up a wealth of knowledge and expertise in the cabling market.

Wide spread market acceptance led to extensive product development and in January 1999 an entire range of Excel products was launched.

For the first time integrators and users alike could benefit from a true end to end cabling system supported by one company and a single no nonsense warranty programme. Products available include Category 6 and Category 5e systems, fibre optics, voice, trunking and containment and networking enclosures.

Each product has been designed with cost, performance, ease of installation and quality in mind.

This document is intended to provide an overview – both technically and commercially – of the many benefits available by specifying and installing an Excel structured cabling system.



Copper cabling – pro

The Excel range of copper cabling products is developing into one of the broadest available.

The Excel Category 6 system was launched back in 2001 after many months of research and development to ensure that the product set was right and met all criteria set out by the standard.

CATEGORY 6

The Excel Category 6 system provides bandwidths of 250MHz and exceeds the Category 6 standards ISO 11801, EN50173-1 & TIA/EIA 568-B.2-1. The range encompasses unshielded twisted pair cable, patch leads, patch panels and modules. The system is backward compatible with Category 5 and 5e systems and therefore allows the user, if required, to spread the cost of implementing a full Category 6 solution. By installing Category 6 cabling from the outset together with Category 5e patch panels and outlets, the costs will be significantly reduced. As and when the time comes to upgrade to a full Category 6 system it's just a simple case of swapping out the patch panels and modules.

duct choice

The Excel Category 6 cabling system is interoperable and will therefore work with components from other manufacturers' category 6 cabling systems. However to obtain the maximum performance we'd recommend that you stick to one particular brand and this also provides the added security of carrying the manufacturers' warranty.

In May 2002, Mayflex led the market by standardising on Low Smoke Zero Halogen (LSOH) horizontal cables as part of its Category 6 Excel solution.

Category 5e systems are available in both unshielded and shielded versions. The unshielded system offers a choice of standard and high density patch panels. Both are available in either Black or Beige allowing clear identification of voice and data services or departments within a building.

The Excel Unshielded patch panels and modules are also available in blue, green and red that can help network managers to easily identify between particular services or departments.

Whether you're installing a Category 5e or Category 6 system a clear easy to use labelling system is paramount to any installation, Excel patch panels can be labelled by using either a self adhesive system, or by use of the optional slide label carrier strip included with each panel.



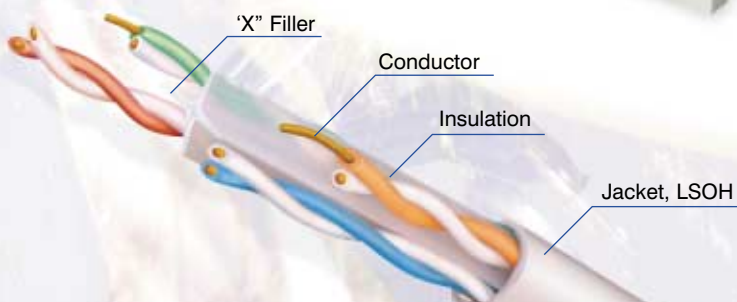
The ExcelPlus patch panels take labelling that one step further. These high density patch panels combine the proven quality and performance of the existing range with enhanced aesthetics and labelling system. Each panel consists of 8 way blocks of RJ45 sockets, housed in a high quality plastic moulding. Each block of 8 sockets has its own label which can be removed from either side of the covered label field. The label strip itself is protected by a clear, tough plastic insert.

The quick and easy to install one piece module fits into either single or double gang flat or bevelled faceplates and comes complete with a slide label position for clear permanent labelling. The Excel low profile module is ideal for installations in shallow floor boxes or dado trunking.



The Excel Triple module offers the ultimate in flexibility, space utilisation and ease of installation. The totally modular design allows the mounting of up to 3 shuttered RJ45 ports in a standard flat or bevelled single gang faceplate, or up to 6 in a double gang facia.

In house screen printing allows the personalisation of products or the addition of identification markings to either patch panels or faceplates.



Excel Category 6 UTP Cable

Fibre Optics – The Future?

Traditionally considered as a backbone or campus media, recent developments in both the cost effectiveness and ease of installation of fibre optic systems have led many users to consider the real possibility of fibre to desk as the ultimate 'bandwidth provider'. Widespread adoption may be some years away but the relentless development of demanding applications make it seem somewhat inevitable.

Faced with such changing standards today's network manager has many options, the decision on what to install must be based on sound technical and financial information with a view to the expected future requirements of the business.



Fibre Cabling – Product Choice

There is no doubt that whether as backbone or campus cables the grade and type of fibre you install will have significant implications. The Excel fibre optic range, ensure all options are available to you. Choose from loose tube or tight buffered cable in either 62.5/125 or 50/125 each suitable for internal and/or external use and all with low smoke zero halogen outer sheaths as standard. With the introduction of OM3 Multimode fibre, transmission speeds of 10Gb are now possible for distances over 300M as opposed to 50M running on standard 50/125 cable. For the more demanding installation armoured cables are available.

The Excel cabling system supports both ST, SC and the emerging small form factor connectors for example MTRJ. Fibre trays are available in either fixed sliding drawer style each loaded with the relevant adaptors, to complete the picture patch cords and pigtails are available in a range of lengths, cable and connector types.

Next Generation Fibre Optic

New performance standards and multimode fibre types have recently begun to emerge to ensure that LAN users can take full advantage of new protocols such as 10 Gigabit – 10Gb/s – over distances previously only possible over singlemode cables. Commonly referred to as 'next generation' fibre of particular interest is what will be termed in the IEC/ISO11801 standard document as OM3 fibre. Cable manufactured to this standard will consist of 50/125 glass and offer the ability to support 10Gb/s at distances of up to 300 metres at the 850nm operating window.

This is a significant advancement in the achievable performance limits for LAN based multimode fibres, made possible by the use of an effective modal bandwidth of 2000 MHz/km at 850nm. The use of low cost VCSEL launch lasers has made the option of multi Gigabit networks a reality for many corporate users.

In an effort to introduce uniformity to tenders and specifications the ISO11801 document will utilize OM – Optical Multimode, and OS – Optical Singlemode prefixes to designate fibre capability in terms of protocol and operating distance. For example the current widely used multimode 50/125 cables will become known as OM2. The table below summarizes the associated performance capabilities.

Maximum Transmission Distance – Metres	10Mbps Ethernet	100Mbps Fast Ethernet	1000Mbps Gigabit Ethernet	10,000Mbps 10 Gigabit Ethernet
300	OM1	OM1	OM2*	OM3
500	OM1	OM1	OM2*	OS1
2000	OM1	OM2	OS1	OS1

*OM1 can be used with a wave length of 1300nm.

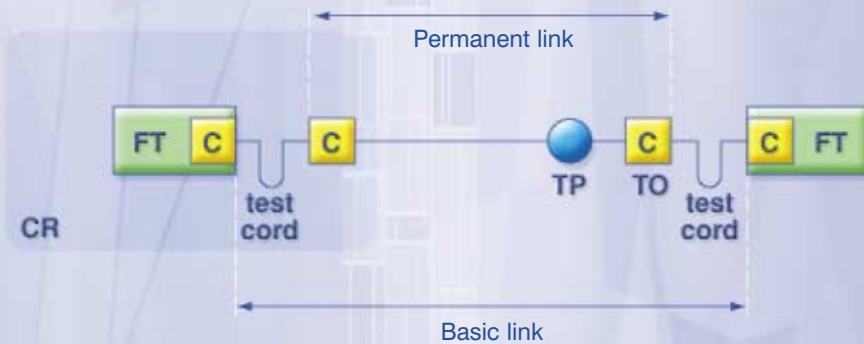
A testing time

Once installed, the cabling system you are investing in must be thoroughly tested to ensure it meets both your requirement and that of the standards discussed earlier in this brochure. Even the best performing cables and components can be significantly affected by installation practices. Some manufacturers accept limited percentage testing of outlets on which to base the issuing of guarantees, others are quite happy for no testing at all to be performed, we insist that our integrators test every single point installed before even considering the issuing of warranty certificates

You can therefore rest assured that each part of your copper infrastructure will be tested with the latest calibrated test equipment for example a Fluke DSP-4300. These units are fully compliant with the latest standards for accuracy and provide detailed analysis of all the important performance characteristics of the installed link such as, crosstalk – near and far end – attenuation, and return loss. Each Excel installation is tested for link compliance, the below diagram shows the permanent link configuration as defined by both the EIA/TIA and ISO standards bodies.



Diagram 2: The permanent link configuration



- FT – Field Tester
- C – Connector
- TP – Transition Point
- TO – Telecommunications Outlet
- CR – Communications Room



Quality Products from Quality Integrators



The Excel Cabling Partner Programme – ECPP ensures only the industry’s leading integrators can offer warranted Excel cabling systems. After a thorough evaluation process each integrator must commit to its engineers attending a comprehensive training course run by our training partner, the country’s leading training provider CableNet.

Regular audits of each integrator’s installation and quality procedures are undertaken by the Excel post sales team to ensure initial standards are maintained. To gain and retain ECPP status each integrator must show a continued commitment to ongoing training and quality control.

To demonstrate our equal commitment we are assisting and actively encouraging our partners in their attaining of the BICSI, Registered Communications Distribution Designer – RCDD – qualification. In America this programme is widely recognised by network managers as the sign of true cabling professionals, each qualified engineer has successfully completed one of the industry’s most comprehensive training courses and stringent examinations. BICSI Europe is now working towards establishing this programme throughout the UK and we firmly believe the RCDD qualification will eventually become a pre-requisite for all major cabling projects.



A worthwhile warranty

The list of companies offering warranties for installed cabling systems in today’s market is almost endless and is still growing. The choice for any user or specifier is made more and more difficult as suppliers make claims and counter claims to support their offerings and to gain market share. Some warranties are little more than product assurances others do offer some degree of protection against future system problems.

We believe the true value of any warranty is the support it provides and the control taken over the quality of product, installation and testing prior to the site handover.

Once site testing has been completed the integrator will provide Mayflex with a copy of each test together with site drawings and other relevant information. Once this has been audited by our Excel post sales team we will issue certification. From the date of issue of this documentation your installation and the products it comprises of are covered by a 25 year workmanship and applications warranty. Any application which operates at up to 100Mhz is guaranteed to operate including Gigabit Ethernet and ATM.

At any time during the warranty period you can rely on the support of Mayflex and your chosen integrator to resolve any issues or concerns relating to the installation.

More than just cabling

Excel is more than just structured cabling, it's a whole range of networking products and ancillary components, ranging from cable ties to cabinets!

Excel provides a comprehensive range of both wall and floor standing cabinets.

The Excel floor standing cabinet has been re-launched with a new look and some improved features. The new enhanced design includes enhanced aesthetics with a metal framed smoked safety glass front door and dark blue piping.



Excel the Future

In a short space of time the Excel range has become a recognised brand and many users have experienced the many technical and commercial benefits available by specifying Excel.

Tens of thousands of points have already been installed and warranted and as the range continues to broaden and develop this number will continue to rise.

Excel – providing a feature rich, competitively priced, structured cabling solution.



Mayflex, a privately owned company, began trading back in 1917. Over the years it has become one of the UK's leading distributors of structured cabling systems as well as a vast range of associated networking products. The head office is based in Birmingham with regional offices located in the City of London and Livingston, Scotland.

MAYFLEX

WWW.MAYFLEX.COM

Call sales on **0800 75 75 65**