



*M&E Design documentation is increasingly critical in its accuracy in modern building design. With the arrival of more and more IP-Connected devices providing several different services in the secure and efficient operation of a building, is it now wise to produce “Generic” Specification documents? Should performance requirements of the client take precedent in delivering recognised standards-compliant reliable solutions, or leave it open to interpretation? And will the new requirements of BS6701 dictating a much higher grade of cable for fire performance finally drive a move to named compliant systems.*

**Current Philosophies**

Until recently, the specification of the Data Infrastructure of a M&E Design Document was a straightforward “Cut & Paste” philosophy based upon a reliance on Specification Templates in industry database resources covering the complete M&E package, or an evolution of previous documentation used in the next project by convenience. The M&E Engineering Consultant has many different responsibilities in fulfilling a modern building infrastructure design, and generating a Data Specification for the Electrical Specification can now no longer be a paragraph simply stating the Category of cable to be used.

The shortfall of knowledge in Structured Cabling design in the M&E Engineering Industry is now being addressed by Trusted Manufacturers assisting in the creation of a modern design for today’s buildings. The use of downloadable industry database documents that can be poorly maintained can result in documents issued for tender being sparse of information and often outdated.

**Intelligent Buildings – Everything Connected**

Modern building design is now driven not only by providing efficiencies for BREEAM classification. The latest building systems are more intelligent than ever, with continuing advancements in IP-Connected building systems resulting in more and more critical services being deployed over Ethernet cabling infrastructure. This Convergence of technology in the last few years has steadily increased the burden placed on the structured cabling system – across all cable types. Current offerings are primarily based around Category 5E, 6 & 6A constructions, of unshielded and shielded varieties. The selection of cable type has traditionally been based around the network speed requirements of the equipment being deployed across the infrastructure – and as described earlier this has historically been desktop, wireless and telephony systems. However, many more building systems are now intelligent devices not in need of high speed, but general network connectivity:

**IP Connected Building Systems**

- Computer Network
- VOIP Telephone Systems
- Wireless Access
- IP CCTV
- Access Control Systems
- IP Digital Signage
- Building Management Systems
- IP TV Systems
- IP Lighting

Each of these cable types is adequately suited to provide network connectivity to these devices at 10/100/1000Mb/s and 10Gb/s in standard use. The expansion in networked devices, and the additional requirement for these devices to be remotely powered across the network cabling has now dictated that a more detailed consideration should be made when selecting a suitable cable type. For the first time, this selection criteria is based upon the end-device requirement with regards to power and not just network speed.

**IP Convergence and Standards Compliant Cabling**

The expansion of IP-connected devices within a building infrastructure and the requirement to remotely power them at various power levels now needs additional diligence within the industry, particularly from the cable manufacturers and the design engineers specifying the provision of these systems.

**DELTA** A PART OF **FORCE** Technology

**Compliance Statement** No. 2017-138A

**Connecting Hardware, Category 6A**  
Including Power over Ethernet Plus  
(Mating and un-mating connectors under electrical load)

**Company**  
Connectix Limited  
500 Avenue West, Skyline 120  
Bramhall  
Essex CM77 7AA  
UK

**Product description**  
Screened Category 6A RJ45 Keystone Jack characterised up to 500 MHz, 100 Ω

**Product identification**  
009-010-010-11

**Generic cabling and cabling components standards - Category 6A connector requirements**

- ISO/IEC 11801:2011, Ed. 2.2
- IEC 60603-7-51:2010
- EN 50173-1:2011
- EN 50173-2:2007 including amendment A1:2010
- ANSI/TIA-568-C2:2009
- IEC 60512-99-001:2012 (Ed. 1.0)

**Technical report** DELTA-T229695, DANAK-1917449 **EC Cabling product ID** 8179 **CS valid until** 21 February 2019

This product has been tested by DELTA EC Cabling Group and complies with the electrical requirements of the above specified standards and Terms and conditions for the EC VERIFIED programme for Generic and Coaxial Cabling, DQP21006. The testing included measurement of NEXT with a compliant test plug and isolation of all the 14 test cases in both measurement directions. The product takes part in a maintenance of certification schedule, which implies that DELTA EC Cabling performs a quality audit of the manufacturer's production and QA sites. The maintenance testing of the product is performed on a sample basis once a year. This compliance statement has been revised.

Hersholm, 21 February 2017

*Lars Lindskov Pedersen*  
Lars Lindskov Pedersen  
Test Manager

*Dennis Andersen*  
Dennis Andersen  
Head of Department

**DELTA - a part of FORCE Technology**  
Vejligvej 9 74 -8572 19 40 00  
2570 Hersholm Fax +45 72 19 40 01  
Danmark www.madebydelta.com/cable

**EC VERIFIED**



Current Standards governed by ISO 11801 now require compliance to standards based around performance not only in data transmission, but also under PoE conditions at Component Level – each individual component in the Link or Channel model. This compliance runs in parallel with the new Construction Product Regulations requirement set out by CENELEC within EN50575, and subsequently in BS6701:2017, which states minimum performance requirements in fire conditions to a Euroclass Cca standard throughout the UK, and should be applied to all upcoming projects for new building designs. This will also be adopted in the upcoming BS7671 IET Wiring Regulations in 2018.

## Component Compliance and Construction Product Regulations

Component compliance when specifying a structured cabling infrastructure is now paramount to the design philosophy. Longevity of the solution has always been a key factor but now with the additional PoE requirement, and with higher budgets above 50W around the corner under the proposed IEEE802.3bt standard, the engineer has a technical responsibility to ensure that the exact ISO, CENELEC and now BS6701:2017 and BS7671 Standards should be clearly set out in the document, leaving no uncertainty as to the requirement – and more importantly ensuring that the proposed systems meet ALL of the industry standards.

The update to Construction Product Regulations has seen the requirement to make changes to the construction materials in producing data cables to new standards in meeting safety requirements in fire conditions. Two important references are:

### **BS EN 50575**

Power, control and communication cables – Cables for general applications in construction works subject to reaction to fire requirements.

### **BS EN 60332-1-2**

Tests on electric and optical fibre cables under fire conditions. Test for vertical flame propagation for a single insulated wire or cable. Procedure for 1 kW pre-mixed flame.

Compliance with these and the complete list of requirements requires CE marking of cables as a result, and is now in place from July 1<sup>st</sup> 2017.

*In Conclusion, more and more IP-Connected devices are being developed to exploit the “Everything Connected” philosophy of the Internet of Things (IoT). The products available to the market and their integration are both industry and client-led. These devices also have a need to be powered remotely across the cabling infrastructure over PoE.*

*PoE levels are evolving, and so the cabling infrastructure standards, product compliance, and importantly the specification of the cable type to support these technologies has never been more critical to the success of the performance and longevity of the system.*

*As a result, the days of the generic cabling specification are behind us. Engineering consultants need to ensure the performance requirements of the cabling infrastructure beyond simply ticking a box on cable type and should engage more closely with a trusted manufacturer compliant with the industry standards in performing their diligence on what is considered by many clients now as the 5<sup>th</sup> Utility.*

*This White Paper has been developed to provide an insight into the evolution of the more detailed requirements to be considered in specifying cabling for modern buildings, and provide some guidelines on how to come up with a Network design that can deploy IP-Connected devices effectively and avoid some of the major pitfalls that have been discussed.*