

# **Industrial Ethernet Products Rise to the Challenges of Factory Environments**

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If you were asked to imagine a computer network, the image that springs to mind would probably be one of a pristine office setting, where networking equipment is kept behind spotless glass doors in a dust- and temperature-controlled environment.

But what of the real world? The world where not all business is conducted by people wearing suits and ties, but also by those wearing protective clothing, safety boots, hard hats and safety goggles? How does a network look in the industrial context? The answer is - exactly the same, only different.

## **The industrial network**

Before we look at why Industrial Ethernet (IE) products are different to standard Ethernet products, we should probably first touch on what an IE is.

An IE is a network that uses standard Ethernet (networking) protocols with rugged connectors and extended temperature switches (in an industrial environment) to network a plant's automation and control systems and frequently also to connect those plant systems to the business systems.

Or in plain English, it's a shop floor network that networks a plant's processes and which is in turn capable of being networked with the company's corporate IT network.

You may well ask why IEs are the subject of growing interest. This is mostly because the migration (in part or in totality) from traditional fieldbus-architecture industrial networks to Industrial Ethernet technology is a growing trend in the industrial sector.

Of course there are many reasons the technology is gaining traction, but the most significant is that more and more manufacturers are realising the immediate as well as long-

term financial benefits of opting for a standard and standards-based technology into which multiple vendors are investing time, effort, innovation and money.

### **Harsh environments**

Environmental conditions are the predominant reason that IE products are different to their standard counterparts.

In contrast to the conditions that are typical of an office environment, industrial locations are frequently subject to high humidity, excessive dust or other particulate matter, extreme temperatures, and vibrations caused by whichever manufacturing processes take place in that location. While these conditions may be customary in the manufacturing world, in the context of standard networking equipment they are what we would call “extreme elements and environmental factors.”

In short, standard Ethernet connectors and switches are wholly unsuited to, and incapable of, operating under these conditions. Yet, the industrial sector increasingly requires such equipment to drive its automation or process controls. What is needed then, are IE devices that are insulated against moisture and particulate matter; able to withstand extreme temperatures; are rugged and robust by design; and which can ensure quality signal and packet transmission across the network.

### **Speeds and feeds**

Transferring data in a fast, efficient and safe manner are additional key considerations in the industrial workplace, and which are increasingly driving the choice of fibre optical network cable, or fibre Ethernet, over Gigabit Ethernet cables.

Whereas the copper wire Gigabit Ethernet cables rely on electrical signals to transmit data and are therefore subject to electrical noise and its associated problems – data corruption and even component damage – fibre Ethernet negates these problems and delivers data faster, over greater distances and more reliably.

In reality though, many industrial networks comprise a combination of legacy Gigabit and new fibre Ethernet cables and so in many instances, switches that support both options are required.

### **Make the right choice**

Our Netshield Industrial products rise to the challenges presented by the proximity of Ethernet technology to industrial processes and the resulting extreme elements and environmental factors – whether that's amid the resultant shocks and vibrations of an industrial forge, or subject to the extreme heat of a heat treatment plant or by virtue of their proximity to industrial furnaces.

In addition, because power requirements in industrial environments are different to those in data networks, Netshield Industrial Products accept dual DC power input, with varying voltage ranges offered by the different products.

These products moreover all feature IP40 protection, affording them protection against the ingress of particles with a diameter greater than one millimetre.

Within the Netshield Industrial Products range are a variety of media converters; managed and unmanaged switches; Ethernet to serial conversion products; a data line surge protector; and industrial power supplies.

These products are designed to enable the delivery of industrial fibre optical networking; serial device networking and communication; industrial Ethernet; video fibre transmission and networking; and industrial wireless networking.

Our products furthermore enable the industrial user to customise the architecture of their IE LAN, using unmanaged switches or intelligent, managed switches. Currently, the most popular architectures use full-duplex switched Ethernet switches that allow multiple users to send information

simultaneously over the network without slowing the network down and ensuring that if collisions do occur, they don't affect transmission times beyond acceptable limits.