

Sticking with what you know

Sometimes the seemingly most simple things are the hardest to perfect, **In2Connect** agrees, taking the tried and test of the connector world and making subtle but effective improvements is a sure way to market success

Industrial applications from the simplest hand held data logger to a fully blown industrial Ethernet system have carried the world's best loved I/O connectors into a harsher and less tolerant environment. Industrial connectors face numerous environmental stresses. In order to support transportation, communications, networking, IT, medical systems, etc. they must match the level of product technology and the rapid development and growth of the sector and must combat temperature and humidity; exposure to liquids, oils and chemicals; shock or vibration and RF/EMI interference. Above all, whatever the specific application, they must provide absolute fail safe reliability.

In most industrial applications, waterproofing of components is arguably the first major add-on to the features required of an indoor interconnect and it has become very clear that many engineers and designers don't want to reinvent interconnects for the sake of it, they want manufacturers to adapt products that they've already got built into BOMs.

As a prime example of this, whilst the D-sub I/O connector is a very mature product it remains extremely popular in instrumentation and industrial contexts and with the accelera-



tion of rugged computers, hand held data loggers, etc. the connector manufacturer has seen an accelerating demand for more robust D-sub designs both waterproof and filtered against RF or EMI. One only has to consider the extreme variety of applications demanding computerised control/communication systems to see what is driving this ~ everything from robotics systems in wet manufacturing; wash-down areas like milking parlours, food preparation plants, car washes; and networking technologies for automating discrete and process manufacturing plants.

As a consequence of this demand, EN 60529 an international classification system for the sealing effectiveness of enclosures for electrical equipment against the intrusion of foreign bodies and moisture was developed by the International Electrotechnical Commission. It isn't specific to connectors, but they form an integral part of entering or exiting most enclosures. This system utilises the letters "IP" ("Ingress Protection") followed by two or three digits. The first digit indicates the degree that persons are protected against contact with moving parts and intrusion: 6 = No ingress of dust; and complete protection against contact.

The second digit indicates the degree of protection of the equipment inside the enclosure against the harmful entry of various forms of moisture (e.g. dripping, spraying, submersion, etc.): 7 = No ingress of water in harmful quantity when immersed in water under defined conditions of pressure and time (up to 1 m of submersion), i.e. temporary immersion. 8 = Suitable

for continuous immersion in water under conditions which shall be specified by the manufacturer but is usually taken to cover depths say between 1 and 3 metres. It doesn't cover the pressures associated with deep sea exploration, etc.

If one takes the ubiquitous D-sub connector, the aim has been to reduce the number of components that make up the connector, hence remove all possible leakage paths and manufacturers have generally produced an IP67 rated connector by adding a mounting plate with a silicone O-ring to create a watertight seal at the panel interface and back potting screw machined contacts to prevent water ingress through the connector body. These are now available in pretty much all of the standard d type configurations excepting crimp. Backpotting of the contacts has to be done once the contacts are embedded in the insulator, so the concept of a truly waterproof crimp d-sub would arguably cost too much to achieve?

Cost of course is amongst the leading drivers, thus the design concept for I/O connectors will always be limited by it ~ so in order to save space and reduce equipment size the industry needs to get more and more signals, such as common signals, microwave signals, optical signals, high voltage signals, power signals into a single connector whilst maintaining circuit or signal separation.

Ethernet has long been the standard communications protocol in the office, but the transition to Industrial Ethernet for shopfloor networks has meant reinforcement to the Ethernet and other similar connectors. Office or shopfloor are built on the same standards-based networking platform, the Ethernet local area network (LAN) standard IEEE 802.3. The key advantage of industrial Ethernet is that it allows manufacturers to deploy a single platform to enable interoperability in connecting workplace operations to corporate and office networks. However, there is a huge difference between installing Ethernet in a sheltered office environment and installing them on the manufacturing floor. If a connector or interconnect fails in a manufacturing system, the cost of parts replacement and repair will be insignificant compared to the indirect costs which could be associated with production downtime.

In2connect

www.in2Connect.uk.com

Enter 223

Main image:

The industrial RJ45 connector from In2connect, suitable for harsh or heavy duty applications

Image left:

Senceive Ltd. wireless mesh monitoring with In2Connect connector

