

Cabling Solutions for Robots & Smart Factories of the Future

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The industrial robots till now were performing complex and repetitive factory processes, but the digitization and technological advancements has increased their applications across various sectors. Manufacturing floors are entering the era of integration and convergence that will aim at reducing costs with increased safety. Robots of the future will be seen working alongside humans in most industrial sectors with increased responsibilities. They will be pivotal in implementing Industrial 4.0 by combining technologies that will allow robots to use big data and analytics, make decisions and function autonomously.

Industry 4.0 or the Industrial Internet of Things (IIOT), refers to the era where the industrial manufacturing processes, equipment, devices and computers are networked. Today, the use of automation and robots have come a long way and play an integral role in re-shaping and re-defining Industry 4.0.

But, it is not just the robots that keep evolving; components such as cables and connectors must keep pace with today's advanced robotics technology. Without a reliable source of power and control, even the sturdiest robots will fail. This evolution has led to an increasing demand for smart cables and connectors that act as a foundation for synchronized robotic function and a high-quality production output. The following factors are essential for cables in advanced robotic applications for Industry 4.0.

High volume data transmission

Machines used in smart factories require data/networking for greater bandwidth with power control cable. This is one reason for installing customized and composite cable solution mix of single/multi-mode fibres with power and control conductors of different gauges and types are assembled under one sheath in these cabling solutions. Hence it takes up less space and reduces installation cost.

Torsion resistant and reverse bending

Machines perform better with customized torsion-resistant cables instead of standard control cables. These modified cables are specially designed to withstand the torsion and repetitive motion of their particular application. The cables are manufactured in a way that it can provide the smallest bending radius possible within the machine. Specifically, designed cables for power chain, cable-track configurations and torsion applications can help overcome the challenges that are presented when designing automation machines. This can also reduce the amount of cable failure during operations.

Highly Flexible

Stud welding machines, for instance, are used by robots for automotive manufacturing. The machine is automatically positioned by the robot and sets the studs for wiring harness assembly in the body shells. This requires the highest levels of efficiency and precision in terms of the executed movements and system productivity. Cabling would need to be laid over all the robot's axes and would therefore need to be able to follow all of its angular movements and rotations.

Slim in construction and lightweight

To avoid restrictions to the robot's movements, various cables are usually laid over the robot axes in the smallest of spaces. This is to avoid any confusion with other cables such as the welding cable, the data network and signal cable as well as the air and protective gas conduits. The cables need to be slim in design and light in weight which would ensure that cables occupy a small cross-section, among the rest.

EMC / Loss-less transmission

A common challenge faced by cable manufacturers is to reduce electromagnetic interference (EMI) by retaining the higher flexibility and slim/light construction. The data network and signal cables need to be protected with additional copper/aluminum screening for this. By using the right insulating material, it is possible to achieve both electrical and mechanical requirements. Combining all these components in complex hybrid cables shall offer loss less transmission, robot-compliant flexibility and torsion strength, with a durability of more than two million bending cycles.

Application-specific and long lasting

System component suppliers need to be able to supply high-quality standard products while also being able to primarily develop individual customized products. The use of standard ware in complex areas, in cases of doubt, leads to unwanted compromises, which in practice can lead to problems with using the machines and production systems. System cable division takes on the often-time-consuming development of individual solutions that can involve intensive consultation, and they do this in cooperation with the customer.

One of the most important sectors that the specified customer groups serve is automotive manufacturing. All components in this sector must meet strict requirements in terms of quality and durability. If, for example, a cable fails, the entire production belt will come to a standstill and trigger losses running into the millions within a very short space of time.

Plug and play / complete connectivity solution

No system is complete without connecting all the individual components and for this, a reliable partner who lives up to the high demands, is essential. Customised solutions are often required in order to

implement new ideas to meet the top line growth requirements of an industry: cables and connectors that you cannot simply buy 'off the shelf'.

With the need to scale up operations and meet production requirements, the demand for customized solutions has been growing and Lapp has been able to prove themselves as a reliable partner for cable assembly. And by providing plug and play solutions, these customized solutions meet the top-line growth of their customers which the standardized 'off-the-shelf cables and conductors generally do not.

Lapp India focuses on providing cable and connection solution for all kind of applications. With smart factory being the focus in the future, Lapp India will be launching ETHERLINE® ACCESS, the managed and unmanaged switches at the Automation Expo 2017 in Mumbai. ETHERLINE® ACCESS along with ETHERLINE® range of cables, connectors and switches will further strengthen Lapp's offering in industrial network solutions and ensure reliable connectivity from one source.

Other innovative solutions focusing on Smart factory includes HITRONIC® fibre optic cables designed to transfer large volumes of data; UNITRONIC® data network cables and field bus components for transmission of simple control signals without leakage; and ÖLFLEX® CONNECT, a customized plug 'n' play solution, specially designed for Machine Tool segment.

Lapp Group, being one of the world's leading suppliers of integrated solutions and branded products for cable and connection technology, is making Industry 4.0 a reality, by manufacturing cabling solutions that willpower not only the robots but make smart factory networked and connected for seamless flow of data thus uniting the business and manufacturing side.