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**A full range of highly reliable cables  
to enhance your industrial performance**

# Challenges to automation

Worldwide, there are one million industrial robots in operation, with 100,000 new robots installed every year.

The automotive industry once led the drive to robotize. However, today, food-producers, warehouses, power utilities, hospitals and even the postal system account for half of the world's robots.

In fact, robot investment growth is up 20% yearly, and bound to increase. What drives this growth? Prices for robots have plummeted, and quality has increased. Robots now cost 46% less than they did in 1990.

Meanwhile, automation systems and process control have radically changed. Today's machines are electronically-driven, and control systems have much improved through Programmable Logic Controllers (PLCs), Distributed Control Systems (for heavy process, large-scale applications), and new PC-based Control Systems.

## What robotic and machine tool manufacturers expect of a cable supplier

- High performance for efficient integration and distributed control
- Quality, reliability and durability to avoid costly stoppages
- Availability and fast delivery for production line flexibility
- Resistance to harsh environments and imperviousness to EMI
- Safety for personnel, e.g. lead- and cadmium-free, and easy recycling
- Conformity to international standards, and cross-industry compatibility
- Excellent service, from testing to support and maintenance

## Assembly lines require a complete range of high-performance robotic cables for production efficiency and process control.





One weak link can interrupt the production chain and delay the delivery of a product resulting in financial loss. To prevent this, Nexans manufactures a full range of reliable, dynamic cables to assure the interconnection, control and process efficiency of robots and flowlines.

We supply everything from miniaturized control cables to state-of-the-art industrial Profinet cables to bring the office and the production floor closer together. Efficiency begins with an up-front requirement analysis. Then, our Nexans research centers test the cables currently used, and strive to surpass them in terms of performance, durability, chemical and oil-resistance.

This move from benchmarking to theory and then back to practical implementation results in customized designs, modularity and appropriate materials that can fit neatly into the entire production process. Thus, together with the world's leading robot and industrial equipment manufacturers, we are creating standards to streamline automation worldwide.

**The best solutions for robotics and industrial assembly**

- A full range of products for power and control functions
- Interconnectivity to merge both the analog and digital worlds
- Optimized conductor and insulation materials (no shrinkage and low hydrolysis)
- Special designs to maintain electrical parameters throughout the life cycle
- Easy strippability and connectivity for installation and replacement ease
- Fire- and heat-resistance for safety and performance
- Imperviousness to oils, fats and other chemical agents
- Technical support tailored to customer needs



**Unshielded power cables**



**Profibus cables**



**Robotic cables**



**Sensor cables**



**Profinet/Industrial Ethernet cables**



**Control cables**



**ASI-bus cables**



**Power cables**



 Nexans... high performance for dynamic applications...

## ROBOTIC APPLICATIONS

### Robotic cables

Carrying energy/data on one or several cores, they perform excellently under high torsion conditions, with low break susceptibility. Nexans manufactures over a hundred sizes (0.14 to 95 mm<sup>2</sup>) in polypropylene (PP), thermoplastic elastomer (TPE) and our own Thermoplastic Modified (TPM) insulations.

*Nexans provides a wide range of robotic cables for the German KUKA Robot Group, the largest producer of robots in Europe and No2 worldwide.*

## CHAIN APPLICATIONS

### Power cables

These screened cables provide power to servos and motors for two-dimensional movements, and are available from 1.5 to 50 mm<sup>2</sup>, delivering from 600 to 1,000 V. Depending upon specific types, cables contain one or two pairs to connect servo breaks and thermal sensors.

*Low capacitance cables are being produced for SEW, a German supplier for robot and machine tool manufacturers.*

### Encoder cables

A control cable, usually 4 to 18 cores, but up to 50 cores, in pairs and quads. They link the central processing unit (CPU) to the machine, for 3-dimensional movements, and opening and closing. With a small bending radius, these quality cables can deliver up to 10 million cycles.

*Schweiger GmbH integrates all Nexans product families in its automated procurement system offering maximum technical and commercial benefits to customers like Index, Grob or Fanuc Automation.*

## CONTROL APPLICATIONS

### Control cables

Multi-standard, easy-to-strip miniature cables (up to 2.5 mm<sup>2</sup>) with a small bending radius and long life (up to 5 million cycles) used for simple on-off control for assembly line machines.

*With our new Thermoplastic Modified (TPM) insulation, the cable's improved dielectric qualities have made it popular with Bosch Rexroth, a prime supplier for the machine tool industry.*

### Unshielded power cables

When EMI is not a problem, these power cables (600 to 1,000 V) provide a cost-efficient solution for servo-motors operating under harsh conditions.

*Lütze uses these cables in cranes for large production halls and port facilities.*

### Hybrid cables

These tailor-made cables contain power, signal cores and CAT 5 quads to deliver unsurpassed energy and control capability.

*Nexans developed these special cables with leading German connector producers and harness makers to meet specific connector and environmental factors for all applications.*

... through technical expertise

### Hybrid cables



## BUS APPLICATIONS

### ASI-bus cables

All bus cables provide signal transmission for wider control purposes beyond simple servo-motor functions. ASI-bus (co-developed with Siemens) is a flat 2-core, 1.5 mm<sup>2</sup> cable which fits into a special module with pins, making it fast and easy to connect within high security systems.

*For its mailing/sorting systems, instead of multicore cables, Siemens preferred an easy-to-install cable which could send several control functions to various "addresses" via a simple two-core cable.*

### Profibus cables

A two-core round cable in a dozen designs for complex control. Delivering up to 12 Mbits/s, Profibus is the leading standard in Europe, and widely used in the automotive industry. Superior mechanical and dynamic properties, as well as fast connections, account for its continuing market dominance.

*Originally co-developed with Siemens in 1989, Nexans is today a member of the Profibus Association, developing cables with 14 other companies and connector manufacturers to create a complete system to assure interoperability.*

### Profinet / Industrial Ethernet cables

To merge office and factory LANs, Nexans offers a symmetrical copper cable with a data transfer rate of 100 Mbit/s (Fast Ethernet) in a 2-pair or a starquad, twisted and shielded cable; copper/copper and copper/fiber solutions, with a 24 V energy feed, and all fiber-optic solutions.

*Drive-CliQ Industrial Ethernet Cables represent the latest state-of-the-art development for servo-drives and motors, allowing both flexibility and high dynamic performance for multi-axis systems.*

## SENSOR APPLICATIONS

### Sensor cables

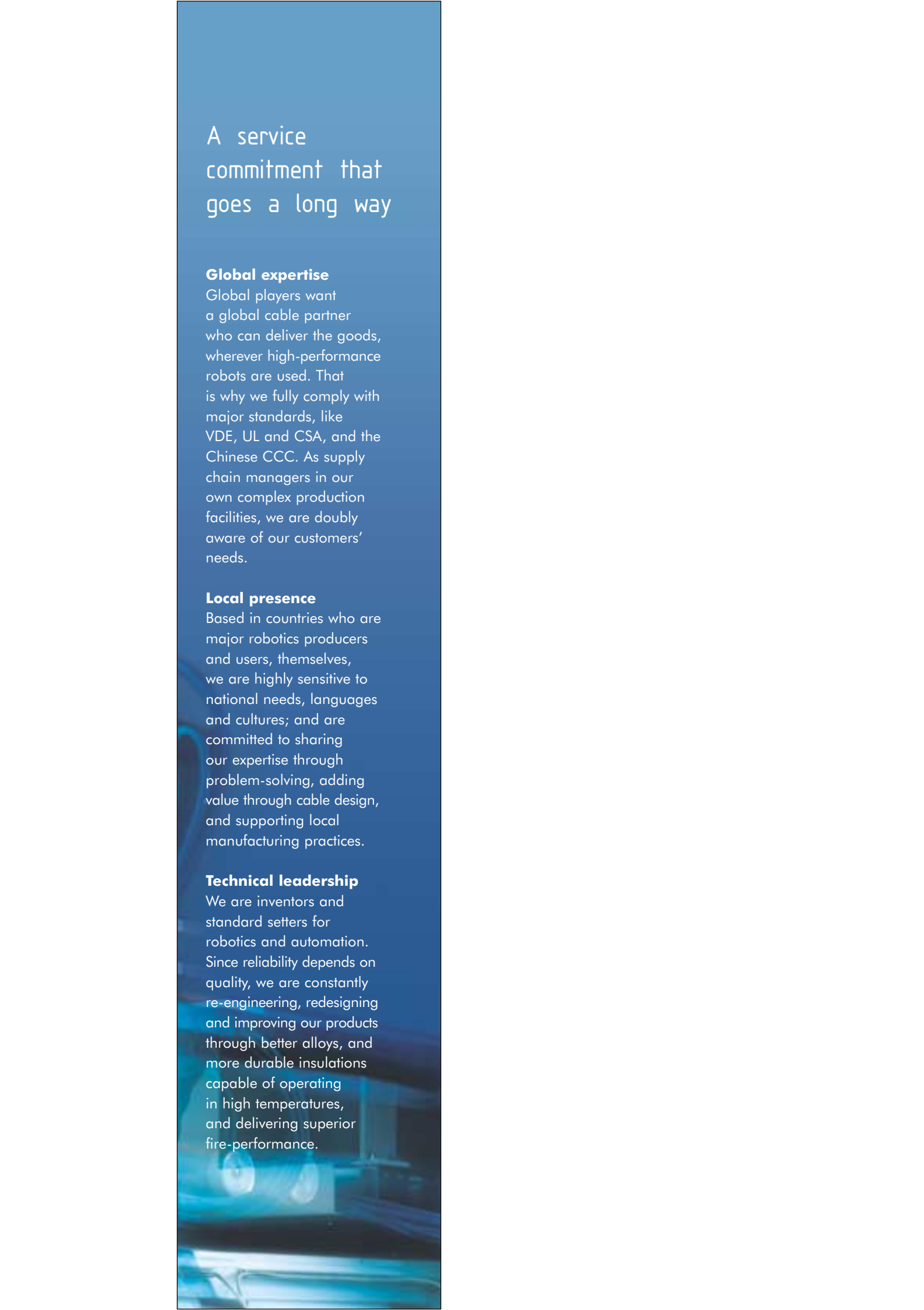
To measure position, heat, liquid level, pressure, vibration, etc., Thermoplastic Modified (TPM) cables provide exceptional reliability in a 2 to 5 core cable, which is Halogen-Free and Flame-Retardant (HFFR).

*For Lumberg, a leader in automation connectors and components, Nexans provided a UL-certified HFFR cable for its Lumflex generation, capable of delivering more than 2 million flex cycles.*



### Encoder cables





## A service commitment that goes a long way

### **Global expertise**

Global players want a global cable partner who can deliver the goods, wherever high-performance robots are used. That is why we fully comply with major standards, like VDE, UL and CSA, and the Chinese CCC. As supply chain managers in our own complex production facilities, we are doubly aware of our customers' needs.

### **Local presence**

Based in countries who are major robotics producers and users, themselves, we are highly sensitive to national needs, languages and cultures; and are committed to sharing our expertise through problem-solving, adding value through cable design, and supporting local manufacturing practices.

### **Technical leadership**

We are inventors and standard setters for robotics and automation. Since reliability depends on quality, we are constantly re-engineering, redesigning and improving our products through better alloys, and more durable insulations capable of operating in high temperatures, and delivering superior fire-performance.



Global expert in cables and cabling systems

Nexans is the worldwide leader in the cable industry, with an industrial presence in 29 countries and commercial activities in 65. The Group employs 20,000 people. Its sales amount to 4.9 billion euros. Nexans brings an extensive range of advanced copper and optical fiber cable solutions to the infrastructure, industry and building markets. Its cables and systems can be found in every area of people's lives, from telecommunications and energy networks, to automation, aeronautics, aerospace, shipbuilding, automobiles, railways, buildings, petrochemicals, medical applications, material handling, etc. Nexans is listed on the Paris Stock Exchange.

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