



## ROBOTICS

INNOVATIVE INTERCONNECT SOLUTIONS  
FOR THE MACHINERY INDUSTRY

EVERY CONNECTION COUNTS

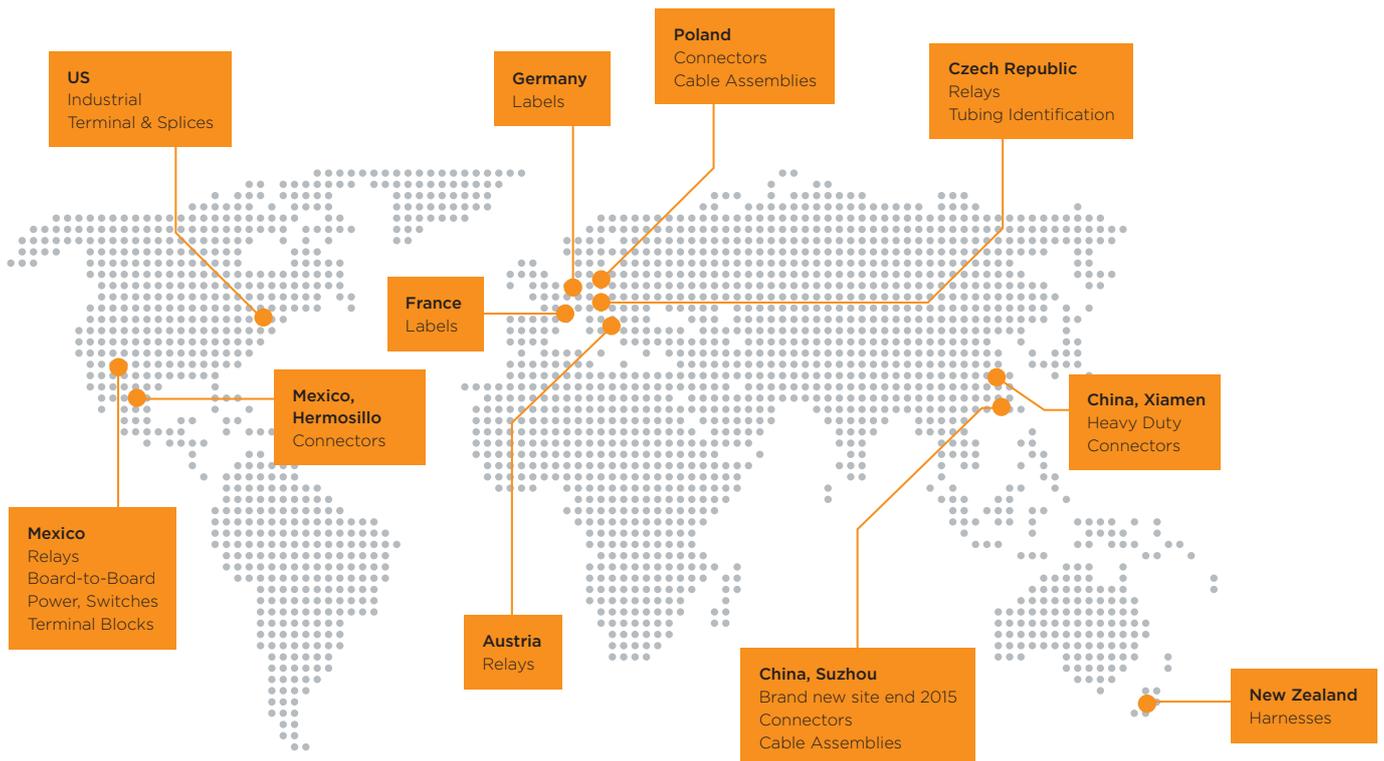
# LET'S CREATE THE CONNECTIONS THAT COUNT



TE Connectivity (NYSE : TE L) is a \$13 billion world leader in connectivity. The company designs and manufactures products at the heart of electronic connections for the world's leading industries including automotive, energy and industrial, broadband communications, consumer devices, healthcare, and aerospace and defense. TE Connectivity's long-standing commitment to innovation and engineering excellence helps its customers solve the needs for more energy efficiency, always-on communications and ever increasing productivity. With nearly 90,000 employees in over 50 countries, TE Connectivity makes connections the world relies on to work flawlessly every day.

# EVERY VISION IS MORE THAN JUST A COLLECTION OF GOOD IDEAS.

Welcome to Automation & Control. TE Connectivity is a major player in plant and mechanical engineering and industrial automation. We have been maintaining partnerships with leading companies in the automation industry in key markets such as Germany, Japan, the United States and China for around six decades.



TE Connectivity worldwide — our production sites

## COUNT ON TE. FROM DESIGN TO DELIVERY TO WHAT COMES NEXT.

Industrial production is increasingly driven by higher automation. By improved safety. By greater energy efficiency. You can count on TE to work with you every step of the way to develop solutions for every aspect of your production processes.

TE designs and manufactures products and solutions that connect and protect the flow of power, data and signal — in every aspect of our lives. We enable smarter, faster, better technologies to connect materials to end products — for all areas of life. This has made us a globally successful company — a world leader in automation and control technology. When it comes to ensuring the perfect solution, we meet every challenge.

## COUNT ON PRODUCTS THAT HELP YOU COMPETE.

Our broad electromechanical and electronic product portfolio covers all your needs, ranging from simple machinery equipment to fully integrated factory automation and process solutions. For applications in a wide variety of production environments — and always extremely close to the needs of our customers from a wide range of sectors.

With TE as your innovation partner, you'll find everything you need to create and operate a cost-efficient and highly reliable production process. We are at our best when we work with your early design product & process management teams to get the job done right from the start. We also offer continuous improvement programs that give you a real competitive advantage. Because you can't achieve greater productivity and efficiency without better connectivity.

# SMART TECHNOLOGY FOR TODAY AND TOMORROW.

Every vision starts with a big idea — and the absolute desire to face new challenges, develop new solutions and pursue new approaches. Our mission is to provide support for problem solvers in pursuing these approaches throughout the world. Working together to develop outstanding visions from big ideas — for innovations that make our world better.

## THE TE 4.0 MANIFESTO

# 01.

**IDENTIFYING OPPORTUNITIES:**  
FOR PERFECT INTEGRATION — AS EVERY CONNECTION COUNTS

# 02.

**TAKING UP CHALLENGES:**  
A NEW GENERATION OF PRODUCTS —  
FOR A NEW GENERATION OF CUSTOMER NEEDS.

# 03.

**CREATING SOLUTIONS:**  
YOU CAN RELY ON TE — AND ON INTERCONNECT SOLUTIONS THAT MEET THE CHALLENGES OF TOMORROW TODAY.

# 04.

**TURNING AIMS INTO REALITY:**  
GREATER PRODUCTIVITY, GREATER EFFICIENCY AND GREATER COST-EFFECTIVENESS — FOR YOU, YOUR CUSTOMERS AND A SMARTER WORLD.

## INDUSTRY 4.0 — THE NEXT INDUSTRIAL REVOLUTION.

The rising levels of automation and decentralization of industrial production present major challenges. Now more than ever, automation solutions need to impress with their profitability — through long operating times, optimized energy efficiency and lower costs.

Industrial production needs to improve in every aspect — both now and in the future — with increased reliability, flexibility, adaptability and decentralization, more automation and smarter connections. TE Connectivity offers innovative solutions for enhanced connectivity. From the PCB level to the production line, in the toughest production conditions, anywhere in the world.

## CONNECTIONS FOR A NEW GENERATION.

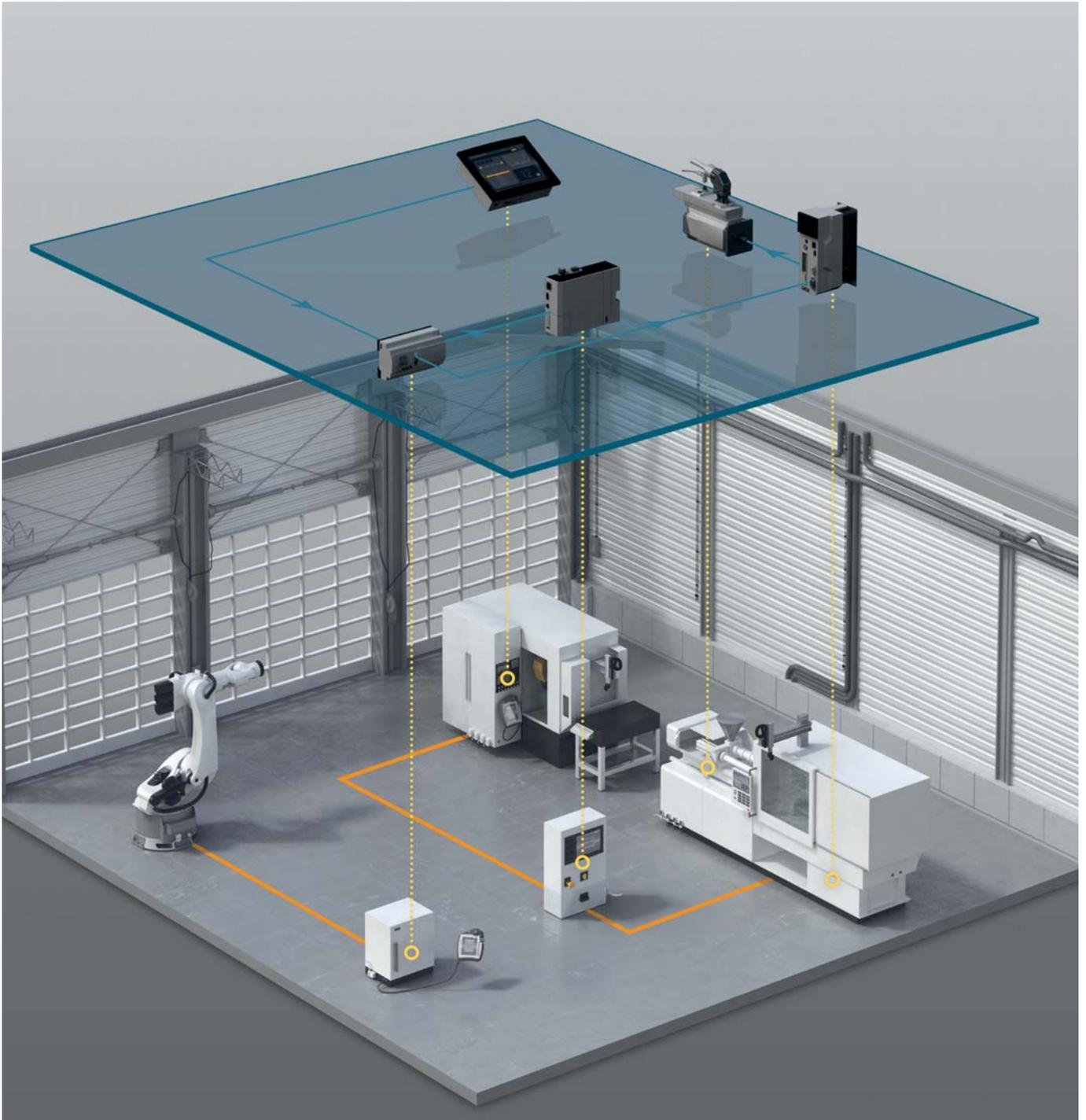
Digital technologies of today are key to the factories of tomorrow. These next-generation plants will be at the forefront of technological development and perfectly integrate and network the Internet, high-tech tools, employees and systems.

Our engineers here at TE are pioneers of this revolution — we are using our innovations to play a key role in turning the next level of industrial production into reality even faster.

# SOLUTIONS FOR MACHINERY.

“WE ARE A SMALL PART OF YOUR BIG IDEAS, AS BETTER AUTOMATION IS FOUNDED ON BETTER CONNECTIONS.”

Gijs Werner, Strategic Marketing at TE Connectivity



# ROBOTICS. SHAPE THE FUTURE WITH TE SOLUTIONS.

Industrial production today is shaped by a market that is changing at an unprecedented speed. Growing demand for personalized products, a never-ending stream of new market requirements and the need for consistently high product quality make the use of highly advanced production systems a must. Industrial robots provide the basis for this flexible production — ensuring you are ready to meet the needs of the future head on.

## BUILDING A COMPETITIVE EDGE. YOU CAN RELY ON TE.

The applications for state-of-the-art industrial robots are growing all the time. From automotive and aircraft construction through to the pharmaceutical industry, logistics and metal or plastics processing — the latest generation of industrial robots can handle ever more complex tasks in a whole range of different environments.

Flexibility, optimum configuration options, high productivity and efficiency are the key factors determining your customers' success. As a manufacturer of robot and control technology, you face the constant challenge of making sure you are ready for everything the future brings your way.

We at TE stand shoulder to shoulder with you in meeting this challenge. Thanks to innovative technology, extensive experience, creativity and a dynamic approach, we can develop the precise products your company needs. In doing so, we are helping to boost reliability, precision and energy efficiency. To give you a competitive edge on the market.

## FOR 360° FLEXIBILITY — CONTACTLESS INTERCONNECTS FROM TE.

Robot systems can be adapted to production processes with ever greater complexity and precision. The range of applications they can handle is also expanding. This is making unlimited flexibility a crucial factor — a requirement that traditional cable connections can no longer satisfy.

TE's interconnect solution has been developed with the future in mind and is known as ARISO Contactless Connectivity. ARISO can reliably transmit power, signals and data without physical contact in virtually any environment. This is made possible by the seamless integration of contactless power supply and high-frequency technology. ARISO is particularly at home in applications involving moving parts and electronic components that need to stay reliably connected in harsh environments.

# PRODUCT OVERVIEW.



## A. ROBOTIC ARM

- A.1 ARISO CONTACTLESS CONNECTIVITY
- A.2 HDC RECTANGULAR
- A.3 CIRCULAR POWER & SIGNAL I/O CONNECTORS
- A.4 DYNAMIC SERIES CONNECTORS
- A.5 CIRCULAR PLASTIC CONNECTORS (CPC)
- A.6 HDC RECTANGULAR
- A.7 CIRCULAR PLASTIC CONNECTORS (CPC)
- A.8 HDC RECTANGULAR
- A.9 M12-X-CODE CONNECTORS

## B. PENDANT

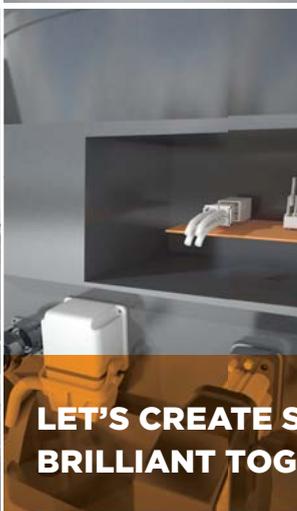
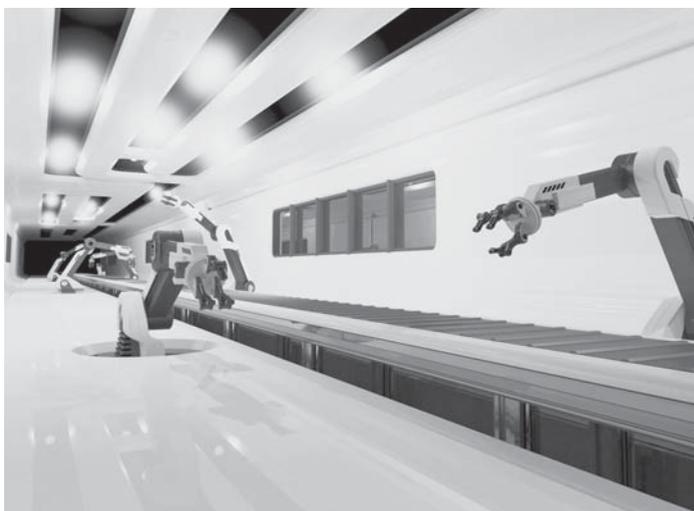
- B.1 CIRCULAR PLASTIC CONNECTORS (CPC)
- B.2 0.80 MM FREE HEIGHT
- B.3 0.50 MM FFC-FPC CONNECTORS
- B.4 PCI EXPRESS CONNECTORS
- B.5 INDUSTRIAL USB CONNECTORS

## C. ROBOTIC CONTROL

- C.1 INDUSTRIAL USB CONNECTORS
- C.2 INDUSTRIAL RJ45 CONNECTORS
- C.3 DYNAMIC SERIES CONNECTORS
- C.4 FORCE GUIDED RELAYS
- C.5 MULTIMODE RELAYS
- C.6 DYNAMIC SERIES CONNECTORS
- C.7 MICRO MOTOR CONNECTORS
- C.8 MINI I/O CONNECTORS
- C.9 INDUSTRIAL USB CONNECTORS
- C.10 HDC RECTANGULAR
- C.11 CIRCULAR PLASTIC CONNECTORS (CPC)

## D. AUTOMATION APPLICATIONS

- D.1 PLC
- D.2 IO MODULE
- D.3 SERVO MOTOR



**LET'S CREATE SOMETHING  
BRILLIANT TOGETHER**

WE ARE DRIVEN BY OUR WISH TO KEEP ON DEVELOPING. THAT'S WHY WE ARE CONSTANTLY WORKING ON INNOVATIVE INTERCONNECT PRODUCTS AND SYSTEMATICALLY IMPROVING EXISTING ONES. WE WORK IN TANDEM WITH YOU IN OVERCOMING EVERY CHALLENGE.

## SHAPING SUCCESS — SMALL CONNECTORS. BIG PERFORMANCE.

Powerful solutions are needed if control technology is to meet the requirements of cutting-edge robot systems. The more diverse the capabilities of highly specialized automated production plants become, the more important it is to employ reliable interfaces to secure the growing volumes of data and power — using interconnect solutions that are as compact and space-saving as possible.

## DISCOVER OUR HIGH-SPEED SOLUTIONS — CIRCULAR CONNECTORS FROM TE.

TE can offer you an extensive range of circular connectors — high-speed solutions optimized for use in controlling intelligent robots. They can be installed very easily and quickly. The robust plastic connectors are cost-effective solutions that comply with industrial standards in every regard and are geared precisely to the manufacturer's needs. They make success controllable — thanks to TE.

## M8/M12 CONNECTOR SYSTEM



TE Connectivity's M8/M12 Connector System for machine industrial automation and control applications provides a solution that safely and reliably ensures communication in industrial environments. TE's solution includes an extensive connector range of receptacles, cable assemblies and IO boxes, and provides users with an interface that supports higher bandwidth needs meeting the requirements of up to 10 Gb/s.

TE's broad product portfolio provides customers with shielded and unshielded cable assembly options in both Cat5e and Cat6A cable types. For re-wiring on site, a range of field serviceable connectors are provided that include male and female versions in multiple positions and codings. Additional styles are available on request including alternative mounting arrangements for panel mount connectors and double ended cable assemblies.

### BENEFITS

- Easily installable connector system reduces maintenance time
- M8/M12 Connector System provides full industry standard solution including quick turn, prototype cable assemblies

## ARISO CONTACTLESS CONNECTIVITY



Unconstrained innovation relies on connectivity. Connectivity that's not subject to any of the old design parameters. Unconfined by movement restrictions.

With ARISO Contactless Connectivity, issues typically affecting connectivity in harsh environments, such as water, dust or vibrations, will no longer impact the reliable delivery of power, data and signals. ARISO Contactless Connectivity can replace complex and expensive harness constructions and slip rings — enabling connectivity where you could not connect before.

### BENEFITS

- Freedom of movement that includes tilt, angle or misalignment
- Rotational freedom that enables faster rotation around more than 360°
- Vibration resistance that enables safe and reliable connections in harsher environments
- Design flexibility and cost savings by transfer of power and signals through fluids and walls

## HEAVY DUTY CONNECTORS



TE Connectivity provides a broad product portfolio of reliable and safe connectors and accessories. The harsh environment connectors are suitable for a wide variety of applications, ranging from industrial machinery to railway facilities or electrical power utilities. The broad portfolio includes standard products, latest innovations as well as customer-specific solutions. Apart from the well-known standard connectors (6 — 24 pins), the product range also offers product series featuring a high number of pins (up to 216) and high current connectors of up to 500 A. The housings are made from die-cast aluminum and are classed IP code 65 — 68. A large variety of customer applications (EMI-protected, corrosion-protected, etc.) rounds off the product range.

### BENEFITS

- Broad portfolio for harsh connectivity, industrial environments
- High quality solution for reliable and safe connectivity

## INDUSTRIAL RJ45 CONNECTORS

## CIRCULAR PLASTIC CONNECTORS

## TERMINAL BLOCKS



TE's Industrial Ethernet RJ45 connectors offer a ruggedized design for use in Industrial Ethernet applications and are equipped with a robust and fast termination technology, utilizing the company's common core design in the RJ45 Modular Plug Series. This solution can be applied in the field without the need for any tools. It significantly reduces installation time and costs. It is used in all of TE's field installable connector series, including IP20, ODVA and push-pull connectors. The Variant 14 push-pull connector is available in a plastic or metal shell, and with its robust termination technology allows fast and flexible field installation that withstands harsher industrial environments such as shock, vibration or temperature.

### BENEFITS

- Field-installable modular plugs
- Easy and tool-less installation
- Ruggedized design for use in Industrial Ethernet applications

Circular Plastic Connectors (CPC) enable engineers to design rugged products quickly, reliably and affordably by offering a versatile range of power and signal connectivity solutions. The circular configuration provides designers with an efficient use of real estate and the mounting options include panel mount, free-hanging and wire-to-board. These rugged, cost-effective and reliable connectors can be used virtually anywhere signals and/or power are needed.

### BENEFITS

- F1 rated material withstands UV exposure per industry standards, prolonging equipment life
- Removable contacts and replaceable coupling ring make field repair easy
- Circular design maximizes contact density, lowering equipment space requirements for power and signal interconnections

TE's Terminal Blocks offer design engineers a reliable connector system with a variety of connection styles and range of centerlines. This solution is used for various data, signal and power applications. This offering provides class leading quality and many different design opportunities.

### BENEFITS

- Mates with industry standard headers on the same centerline spacing
- Fast wire connections
- Custom solutions available

## RELAYS



TE's broad relays portfolio includes low power PCB relays, panel-plug-in relays or force guided relays that are key electromechanical switching components used within safety relay circuits. They enable the recognition of a contact's switching condition in a simple and safe manner. With the normally open (NO) and normally closed (NC) contacts of a force guided relay being insulated from each other, the load and monitoring circuit may have different voltage potentials. Monitoring machines and processes, relays help protect people's lives when danger needs to be averted.

### BENEFITS

- Overcurrent protection and safety
- Small and compact size offers space saving
- Broad range of industry-leading relays

## DYNAMIC SERIES CONNECTORS



Dynamic Series is a broad product family that provides connector solutions ranging from signal level circuitry through power circuit connectivity in a ruggedized, industrialized package. The connector family is designed for use in control system applications and is suitable for a wide range of applications requiring high density, signal and power applications.

Dynamic Series consists of wire-to-board, wire-to-panel and wire-to-wire connectors with diverse housings available to meet most applications. Standard crimp and spring clamp variations of parts are available. The standardized contacts limit the amount of application tooling required.

### BENEFITS

- Easy mating and unmating for reduced installation and maintenance time
- Three points of contact provide high electrical reliability
- Reliable and safe connections for increased productivity

## MOTORMAN HYBRID CONNECTOR



The fully configurable Motorman connectivity solution integrates communication, signals and power for real-time control at higher performance and half the size of current standards. The innovative design and compact size of the Motorman hybrid connector allows for significant space savings in comparison with traditional rectangular industrial connectors. It also helps to keep costs to a minimum by reducing the amount of overall cabling needed as well as shortening cable length.

### BENEFITS

- Spacious side access to the inside assists easy and safe configuration
- Robust contact system to help minimize effects of impact and vibration
- Integration of power, signals and communication in compact design offers considerable space saving
- Contacts may be mounted selectively allowing for design flexibility

# CABLE SERVICES FROM A SINGLE SOURCE — TE CONNECTIVITY MEETS ALL YOUR NEEDS.

TE Cable Assemblies takes care of its customers, with total solutions that fit precise needs. With our decades of experience, global expertise in development and manufacturing and worldwide network of competence centers, TE Cable Assemblies creates customized solutions and standardized products that work exactly as they should — to ensure high performance and cost-efficiency in any operation. Our cumulative experience is formidable — and we never forget that every customer, and every project, is unique.

## **WE DELIVER FAST:**

FAST RESPONSE &  
IMMEDIATE AVAILABILITY

## **WE FOCUS ON SOLUTIONS:**

FLEXIBLE & EXPERIENCED

## **WE SAVE YOUR TIME:**

FAST & ON SCHEDULE

## **WE PROVIDE SECURITY:**

PROVEN RELIABILITY & HIGH QUALITY

## **WE WORK SEAMLESSLY:**

SMOOTH EXECUTION &  
CONSTANT COMMUNICATION

## **WE COMBINE POWER WITH FLEXIBILITY.**

TE Cable Assemblies is on hand to identify our customers' needs and objectives, map out the issues that need resolving, and quickly take all the steps necessary to move from design into production.

To provide fully integrated solutions, TE engineers in cable assemblies development work hand in hand with development teams dedicated to connectors — our engineering teams can leverage our vast portfolio of connectors to make sure any solution provides a perfect fit for a customer's needs. And when it comes to creating the assemblies themselves, numerous automatic and semi-automatic manufacturing technologies are at our disposal — cutting & stripping, soldering, IDC insulation displacement, over-molding, and more.

TE Cable Assemblies' manufacturing footprint is global too — wherever you are, we are well placed to respond to your needs in terms of flexibility, reliability, and lead times.

## **WE MAKE SURE OUR HIGH STANDARDS NEVER SLIP.**

Quality control is completely integrated throughout all our global manufacturing facilities. Furthermore, we apply the TE Operating Advantage (TEOA) — an enterprise-wide focus on business performance and continual improvement through waste elimination and deployment of best practices.

To meet numerous challenges all the way from concept to commercial product, we deploy processes such as Lean Product Development while dedicated project managers take care of your needs and potential issues. If a problem occurs, we will fix it.

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