

**HMI**  
INNOVATIVE INTERCONNECT  
SOLUTIONS FOR AUTOMATION

EVERY CONNECTION COUNTS

# LET'S CREATE THE CONNECTIONS THAT COUNT

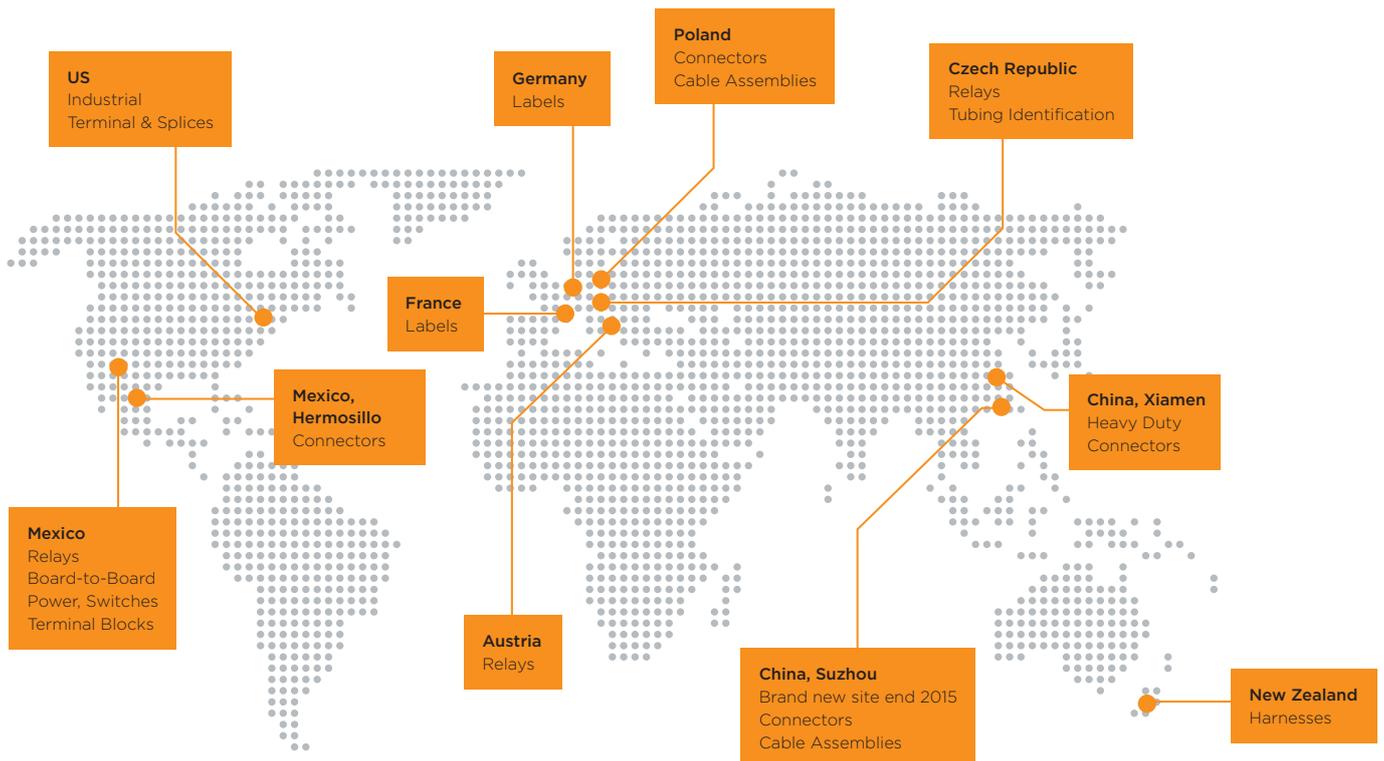


TE Connectivity (NYSE : TE L) is a \$13 billion world leader in connectivity. The company designs and manufactures products at the heart of electronic connections for the world's leading industries including automotive, energy and industrial, broadband communications, consumer devices, healthcare, and 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.

To connect with the company, visit: [www.TE.com](http://www.TE.com).

# 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.

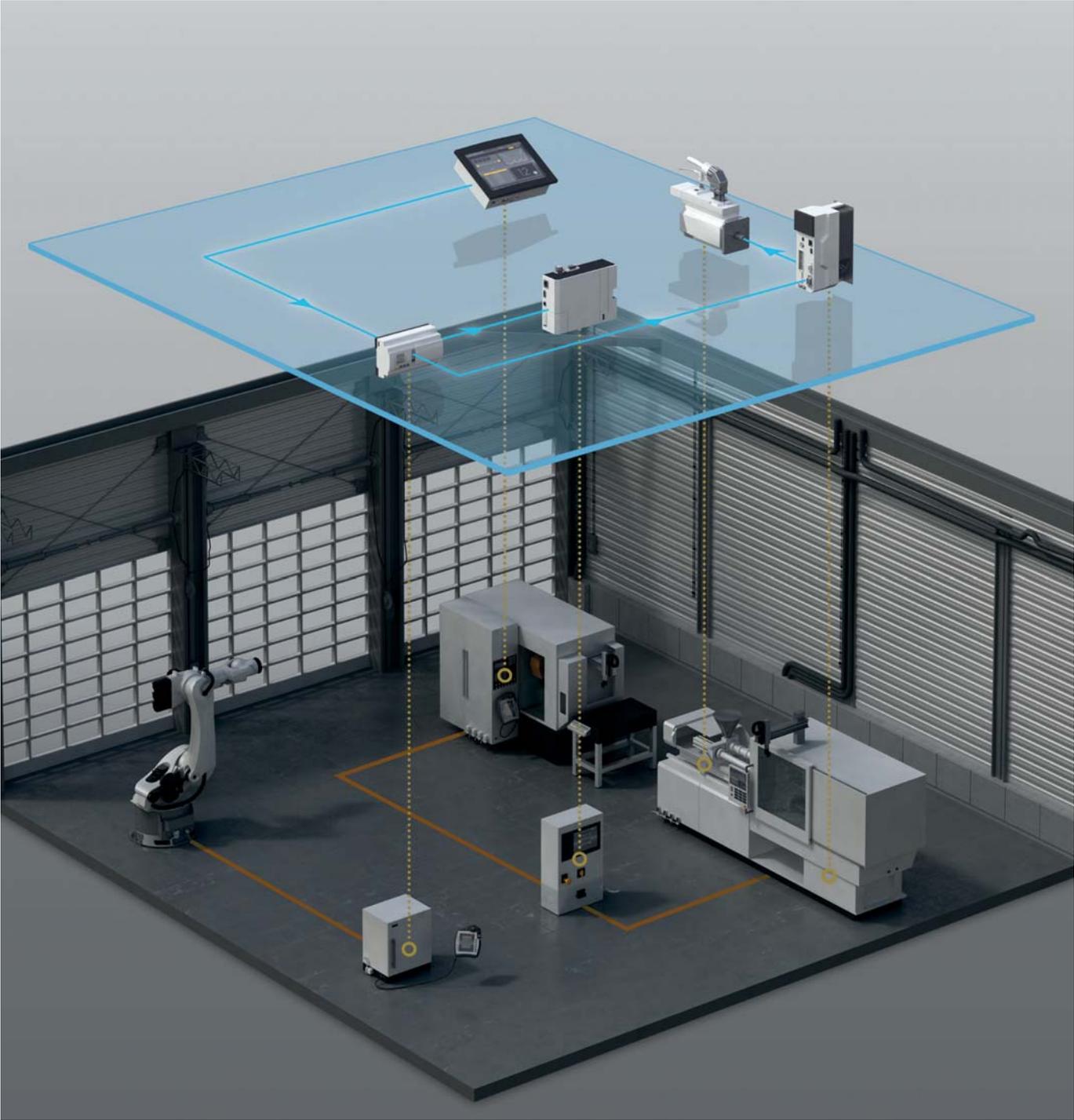
Digital technologies of today are key to the factories of tomorrow. These next-generation plants will be at the forefront of technological development and perfectly integrate and network the Internet, high-tech tools, employees and systems.

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 AUTOMATION.

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

Gijs Werner, Strategic Marketing at TE Connectivity



# HUMAN MACHINE INTERFACE (HMI). SAFETY AND RELIABILITY WITH TE.

As the extent of automation in industrial production grows, so the need for highly functional HMIs that are intuitive and easy to use is also increasing. Safe, reliable connectors are essential for this. Industry solutions from TE provide the answer — standard connectors that go way beyond “standard” and deliver reliability and protection against system outages.

## COMPLETE CONTROL OF THE PRODUCTION LINE. YOU CAN RELY ON TE.

The HMI serves as the interface between the operating system of an automated production plant and a human operator and as such is a core element in the overall production system. It is here that the plant’s output and productivity are decided.

A high level of user friendliness and large processing capacities are therefore crucial. Fast and smooth input options are just as important as the ability to depict the key control data from the process in real time.

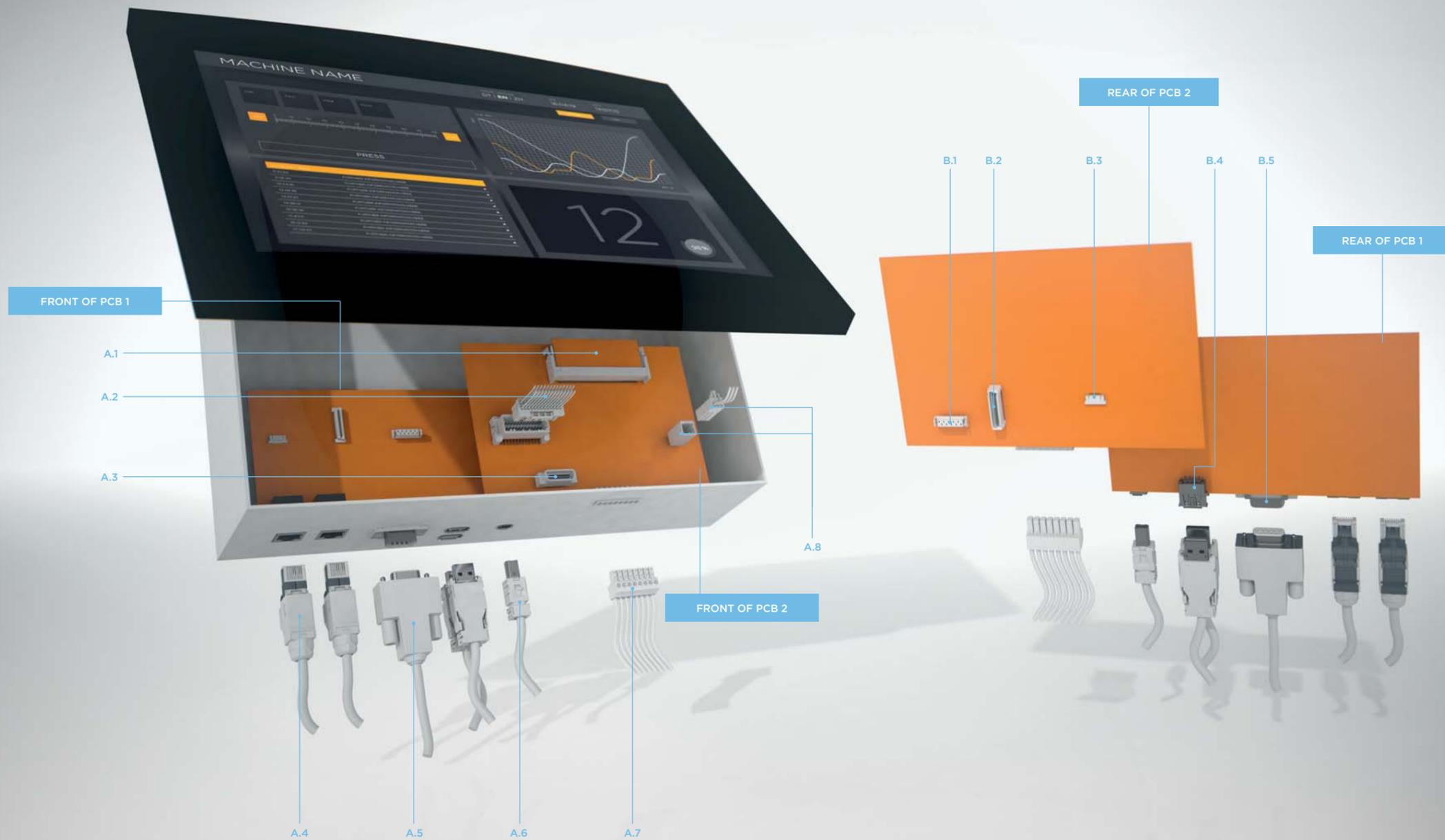
State-of-the-art HMIs are based on the functional design of smartphones and tablet PCs. The combination of easy-to-use touchscreen and hard-wearing equipment provides the basis for a long service life, even under industrial conditions. After all, production outages are not an option — we ensure a level of dependability that your customers can rely on at all times. And that also applies for large volumes of data and in difficult production environments.

## SUCCESSFUL INTERCONNECT SOLUTIONS FOR GREATER PRODUCTIVITY, QUALITY AND EFFICIENCY.

At TE we understand the special challenges facing the HMI market. We know your customers’ requirements and needs and the importance of constant innovation.

To provide you and your customers with the best possible support, we use next-generation technologies to develop future-proof products that are more stable, user-friendly and faster to install. We are committed to growing your success — with reliable connectors that also give you maximum freedom in designing applications.

# PRODUCT OVERVIEW.

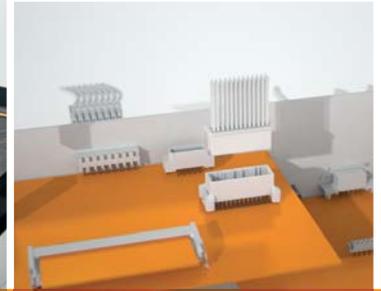


## A. PRODUCTS

- A.1 M3 MEMORY SOCKET
- A.2 DYNAMIC SERIES CONNECTORS
- A.3 CHAMP CONNECTORS
- A.4 INDUSTRIAL RJ45 CONNECTORS
- A.5 D-SUBMINIATURE CONNECTORS
- A.6 MINI I/O CONNECTORS
- A.7 TERMINAL BLOCKS
- A.8 DYNAMIC SERIES CONNECTORS

## B. PRODUCTS

- B.1 1.27 MM MICRO-MATCH CONNECTORS
- B.2 0.80 MM FREE HEIGHT
- B.3 0.50 FFC-FPC CONNECTORS
- B.4 INDUSTRIAL USB CONNECTORS
- B.5 D-SUBMINIATURE CONNECTORS



**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.

## INTERRUPTION-FREE INTERCONNECT SOLUTIONS FROM TE.

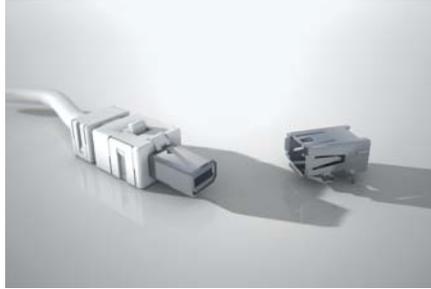
TE can offer you a broad range of industrial I/O interconnect systems such as USB, Ethernet RJ45 or Industrial Mini I/O connectors. They are all geared to the particular needs of the HMI market. As highly robust products they satisfy the relevant industry standards and also perform extremely well in harsh environments. Our USB connectors, for instance, are equipped with an integrated locking mechanism that prevents any unintentional cable releases.

The TE portfolio of Industrial Ethernet RJ45 connectors extends all the way to high-speed versions for data volumes in the Gb range. Our Industrial Mini I/O connectors have also been designed with the future in mind. Two points of contact and a stable lock function ensure robust, interruption-free connections, while the compact design ensures exceptional design flexibility — with a space saving of up to 75% versus Industrial RJ45 connectors.

## INDUSTRIAL RJ45 CONNECTORS

## INDUSTRIAL MINI I/O CONNECTORS

## INDUSTRIAL USB CONNECTORS



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

TE's Industrial Mini I/O Field Installable connector provides innovative and time-saving wire-termination while also serving as a space-saving and reliable I/O solution for industrial environments. TE's Industrial Mini I/O connector is only one quarter the size of the conventional RJ45 plug and, as a result, provides space saving and the flexibility to use limited space on the PCB more effectively. Designed with two points of contact, this connector is built for the stringent demands of an industrial and high vibration environment, enabling increased productivity through a reliable connection. With its innovative piercing termination, the Mini I/O Field Installable version decreases the time usually needed to terminate the wires through soldering and, with an easy to use hand tool, field assembly in virtually any environment is now possible.

### BENEFITS

- Less downtime and reliable connections due to better vibration resistance than RJ45
- Space saving of up to 75% versus Industrial RJ45 connectors and increased design flexibility
- Easy, field installable solution

TE's Industrial USB connectors are ideal for all industrial USB applications where a high locking force or a sealed design is required. With the IP20 series of Industrial USB connectors that feature an integrated locking mechanism with audible and tactile feedback, TE offers an excellent interconnect solution for internal USB cable routing. The newly designed locking feature helps prevent accidental pull-out of the plug, which enables customers to secure a cable internally without having to worry about the plug coming loose during transit and use.

### BENEFITS

- Rugged IP20 and Sealed IP67 solution for harsher environments
- Excellent lock strength for reliable connections and less downtime

## MEMORY SOCKETS

## DYNAMIC SERIES CONNECTORS

## TERMINAL BLOCKS



TE Connectivity's main Memory connectors are made to JEDEC industry standards for SIMM (Single In-line Memory Modules) and DIMM (Dual In-line Memory Modules). The TE Connectivity product portfolio covers the current SDRAM & DDR memory generations as well as the new DDR2, DDR3 and FB-DIMM generations of sockets. Each product family consists of vertical, right-angle and various angled configurations in solder tail, press fit and SMT mounting options.

### BENEFITS

- Standard plastic latches and extractors ensure proper module retention and extraction
- Reliable in high temperature environments
- Available in variety of angle configurations and mounting options

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

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

## CHAMP CONNECTORS

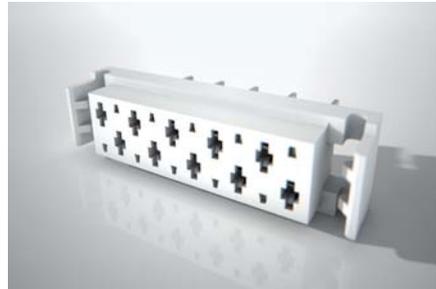


The TE Connectivity CHAMP connector system terminates to a printed circuit board, ribbon cable and discrete wire. This solution is designed on various centerlines. Found in multiple industries, these solutions are used in telecommunication hubs and cabling, computer devices, networking hardware as well as medical instruments, consumer test products and industrial machines.

### BENEFITS

- Reliable and durable in high density applications to withstand repeated mating
- Available in various position sizes and Printed Circuit Board mount styles
- Position range from 20 to 200

## MICRO-MATCH INTERCONNECTION SYSTEM



TE's Micro-MaTch connector family, with its contact spacing of 1.27 mm, offers a variety of wire-to-board and board-to-board interconnections. The Micro-MaTch Interconnection System enables design engineers to cover multiple signal applications with one of the smallest flat ribbon cable connections. The connector family fully complies with the electronic packaging requirements of today and the future. Relative movements caused by vibrations/thermal expansion between male and female contacts are absorbed by an additional positioning spring in the female part. By preventing movements on the contact spot, a gas tight connection can make the Micro-MaTch contact spring system resistant to fretting corrosion, one of the traditional failure modes in tin-plated connections.

### BENEFITS

- One of the smallest systems available at 1.27 mm
- Tooling options provide manufacturing application flexibility
- Insulation displacement contact allows for labor cost savings

## FLEXIBLE PRINTED CIRCUIT BOARD CONNECTORS (FPC)



TE Connectivity's Flexible Printed Circuit Board connectors (FPC) are interconnect solutions that are ideal where small centerline spacing makes larger wire-to-board interconnects impractical. As the market trends towards miniaturization, FPC connectors have been developed to meet the challenges of this expanding market, which demands smaller centerline or pitch spacing, lower profile heights and lighter interconnect solutions. The TE Connectivity FPC solutions are reliable interconnects that utilize an actuator to secure the cable termination and are field terminable (requires no tooling).

### BENEFITS

- Reliable interconnects
- Field terminable — no tooling needed
- Available in Right-Angle and Vertical mounting orientations

# 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.

## LET'S CONNECT

We make it easy to connect with our experts and are ready to provide all the support you need. Just call your local support number or visit [www.te.com/industrial](http://www.te.com/industrial) to chat with a Product Information Specialist.

## TECHNICAL SUPPORT

[te.com/support-center](http://te.com/support-center)

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Brazil	+55 11 21036000	Italy	+39 011 4012111	Slovenia	+38 615 602132
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