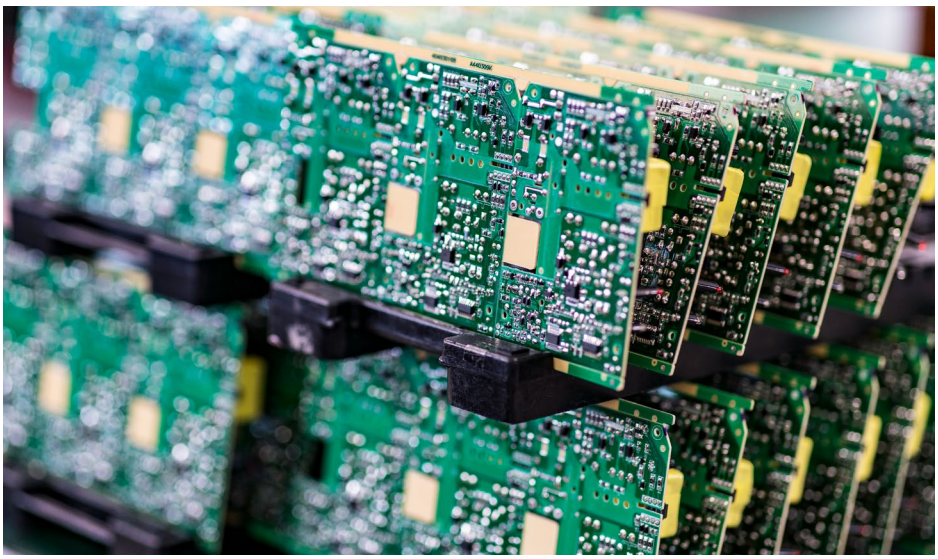


AUTOMATION CONTROLS: ERNI

High-Speed Components for High-Speed Industries

LET'S CREATE THE CONNECTIONS THAT COUNT.

TE Connectivity (NYSE: TE L) is a $16 billion global 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 more than 50 countries, TE Connectivity makes connections the world relies on to work flawlessly every day.

To connect with the company, visit te.com.

RELIABLE TECHNOLOGY FOR TODAY AND TOMORROW.

Providing High-Speed, Rugged Connectivity for Reliable Real-Time Communication

TE Connectivity worldwide — our production sites

As a global technical leader in connectors and sensors, TE Connectivity (TE) offers products and integrated solutions that are precisely engineered to meet the strictest customer requirements in terms of quality and performance excellence. For more than 60 years, we have maintained a partnership with the leading companies in major markets, such as Germany, China, Japan, and the United States.

TE provides customers with high-quality innovative solutions and fast, reliable services in the fields of automation and control, railways, and intelligent buildings. TE offers products that have demonstrated their superior performances in harsh environments, such as high pressure, vibrations, humidity, and high/low voltage.

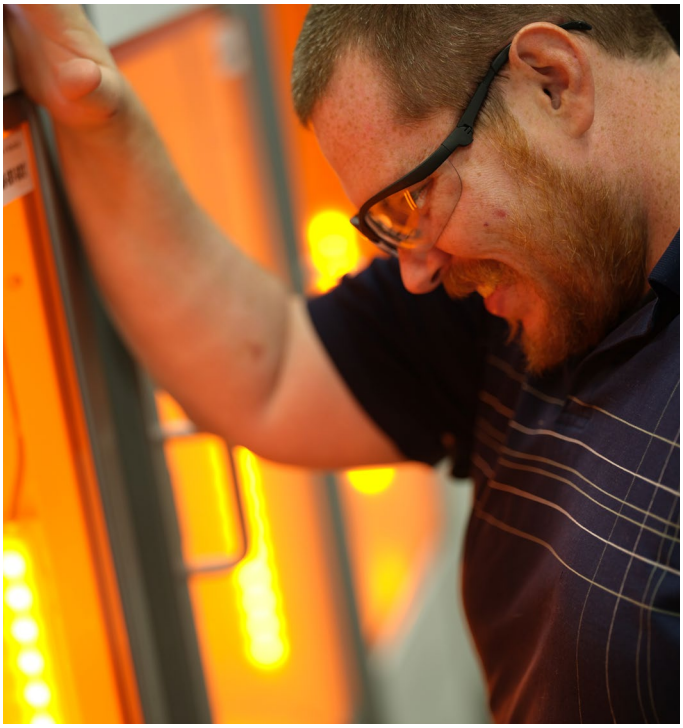
With the arrival of Industry 4.0, TE plays a key role in the next level of industrial production and is committed to achieving win-win results with customers.

With TE as an innovative partner, you will find virtually everything you need to create and run a highly cost-effective and more reliable production process. We connect materials to final products with smarter, faster, and better technology to cover all the areas of life. To help ensure that each solution is optimized, TE actively rises to every challenge.

POWERFUL AUTOMATION REQUIRES POWERFUL CONTROLS.

From human-machine interfaces to distributed factory controls, we can help you increase productivity and safety on the floor and throughout production.

As industrial production becomes increasingly automated, the need to effectively integrate and operate numerous devices and systems on the shop floor is growing exponentially. Today's factories require high-speed, smart connectivity products to ensure interoperability and seamlessly manage power and data requirements. As this trend continues, the demand for electromechanical system solutions that integrate power, signal, and data will grow with it.



Our Commitment to Automation Controls

With a vast connectivity portfolio and deep technology expertise in automation controls, TE is strongly positioned to be a strategic, trusted technology partner. We are focused on deep integration with our key customers, including both global and local support from design to production, and engineer-to-engineer collaboration.

We have aligned our departments to the opportunity in automation controls. We will continue to invest in our existing portfolio as well as next-generation technologies to bring the best solutions in connectivity, sensors, switches, relays, and terminal blocks to market.

TE PROVIDES INDUSTRY-LEADING CONNECTIVITY SOLUTIONS.

Depend on TE to customize the automation control solutions you need for high processing power with a small footprint.

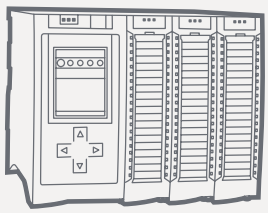
From real-time control to the mass adoption of edge-to-cloud architecture, automation use cases are moving faster than ever, demanding higher data transfer rates, increased reliability, and modularity. You need an engineering partner and component supplier that can keep up with your evolving needs and the fast pace of the industry. Consider TE your go-to expert for the components and solutions that make up the building blocks of today's industrial automation.

When you partner with TE, you get:

- **Significant electromechanical and safety experience** with deep understanding of communication protocols and requirements to help enable more reliable connectivity solutions in harsh industrial environments.
- **Engagement in standardization committees** for new industry communication standards.
- **Fully integrated system solutions** for power, signal, and data.
- **Stronger, smarter, safer connections**.

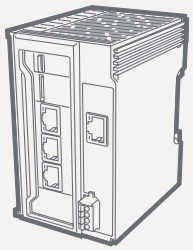
YOUR SOLUTIONS FOR AUTOMATION CONTROL SUB-APPLICATIONS.

As your go-to engineering partner, we can help simplify your supply chain and provide more reliable, tailor-made components.



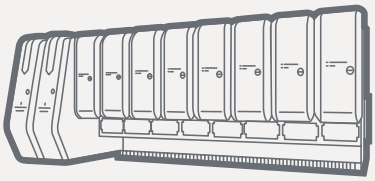
PROGRAMMABLE LOGIC CONTROLLERS (PLCs)

PLCs monitor the state of input devices and make decisions based upon a custom program to control the state of output devices. Inputs include but are not limited to limit switches, proximity sensors, and temperature sensors. There are several PLC types to meet a diverse set of automation use cases. The previously mentioned types include but are not limited to nano-PLCs, medium-PLCs and safety PLCs.



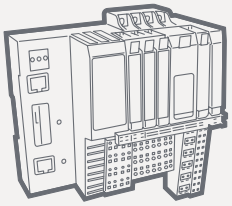
INDUSTRIAL PCs (IPCs)

IPCs monitor the state of input devices and make decisions based upon a custom program to control the state of output devices. These devices are able to withstand the harsh environment of a production facility, possessing great processing power and memory capabilities able to host a full-fledged operating system.



DISTRIBUTED CONTROL SYSTEMS (DCSs)

DCSs supervise and coordinate controllers distributed across a plant, orchestrating process-wide operations. Reliability is paramount; therefore, automation companies provide not only control equipment but also supervisory systems and interfaces as an integrated package.

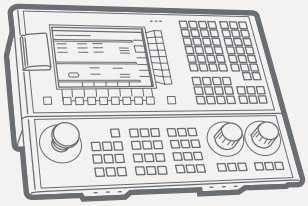


INPUT OUTPUT MODULES (I/O)

I/O modules are the building blocks of PLC, DCS, and IPC–based automation, connecting control devices to the outside world. These devices handle discrete and analog signals from sensors, actuators, and other devices. There are several I/O modules types that enable automation deployment in several areas. The previously mentioned types include but are not limited to modular I/O, slice I/O, and block I/O.

HUMAN-MACHINE INTERFACE (HMI)

HMIs facilitate human-machine interaction through the usage of tactile buttons and screen. These devices leverage custom software to display production units, allowing interaction with its inputs and outputs.



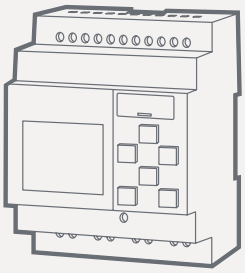
CNC CONTROLLERS

CNC controllers are industrial computers used to control metal cutting or forming of a work piece by means of a prestored program in the systems' memory. These devices interpret a prestored program, initiating response through several functions that range from linear to multi-axes motion.

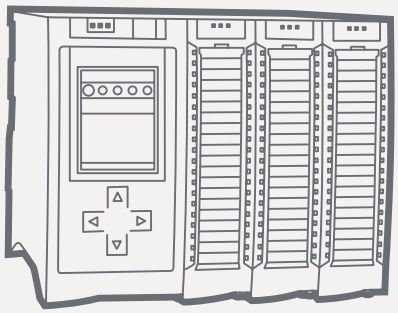
PROGRAMMABLE LOGIC CONTROLLERS (PLCs)

Used to monitor the state of input devices and make decisions based upon a custom program to control the state of output devices, programmable logical controllers (PLCs) come in a variety of sizes and options.

SUB-APPLICATIONS

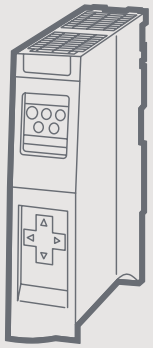


NANO TO SMALL PLCs

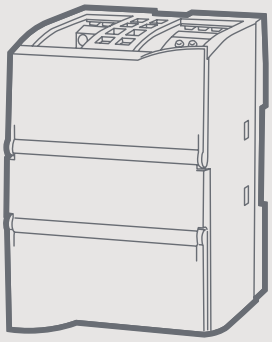


MEDIUM TO LARGE PLCs

COMPONENTS



CPU

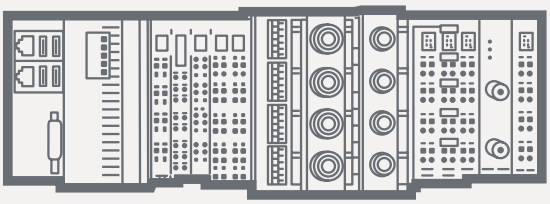


POWER SUPPLY

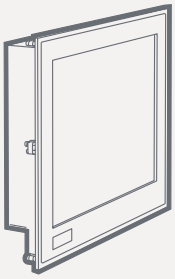
INDUSTRIAL PCs

Built from similar components as commercial PCs but able to resist the harsh environment of a production facility, industrial PCs (IPCs) possess great processing power and memory capabilities and are capable of working with very short program scan times and multiple I/O points. IPCs also support both high- and low-level programming languages.

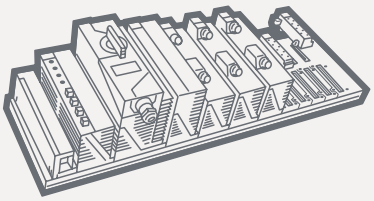
SUB-APPLICATIONS



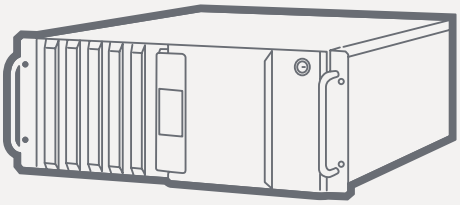
IP20 RATING



PANEL PCs

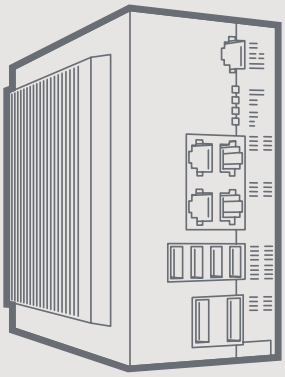


IP65 AND IP67 RATING

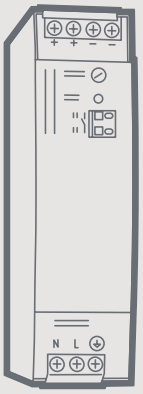


RACK PCs

COMPONENTS



CPU

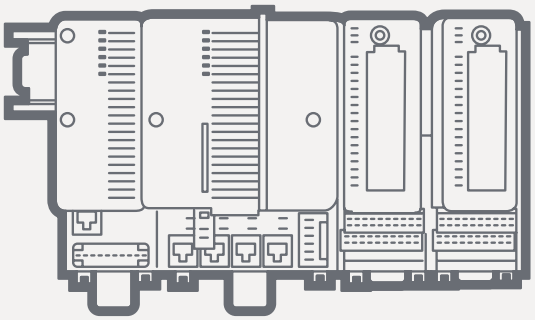


POWER SUPPLY

DISTRIBUTED CONTROL SYSTEMS (DCS)

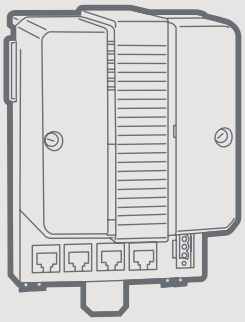
The distributed control system (DCS) supervises and coordinates each of the controllers distributed across a plant, orchestrating process-wide operations. Because reliability is so important, manufacturers provide control equipment plus supervisory systems and interfaces so customers buy a complete, integrated package. Given the distributed (rather than centralized) nature of the system, it has grown in popularity as an excellent solution for manufacturers that want something scalable and flexible to suit their needs.

SUB-APPLICATIONS



CONTROL MODULES

COMPONENTS



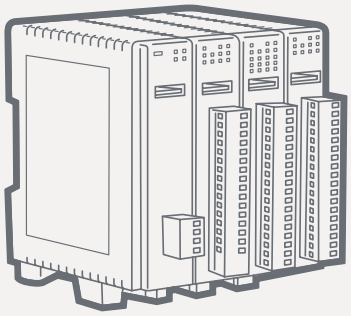
CPU

POWER SUPPLY

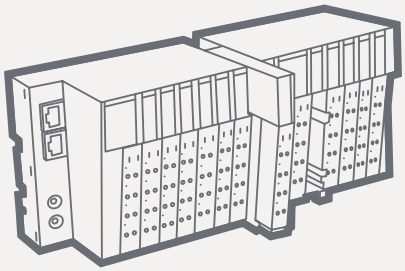
I/O MODULES

I/O modules connect control devices to the outside world; they are the building blocks of programmable logic controllers, distributed control systems, and industrial PC automation deployment. Manufacturers rely on I/O modules to handle discrete and analog signals from sensors, actuators, and other devices. Certain modules possess capabilities to process specific input types, such as intelligent I/O. The devices can be found inside control cabinets or on the shop floor, and can be connected next to the control device (local I/O) or, due to vibration and temperature conditions, away from it (remote I/O).

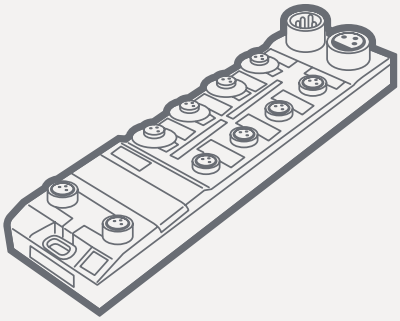
SUB-APPLICATIONS



MODULAR I/O



SLICE I/O



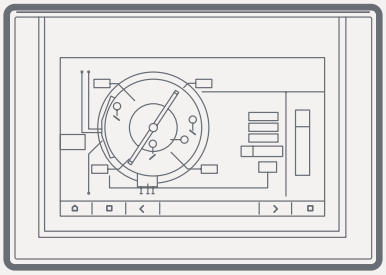
BLOCK I/O

HUMAN-MACHINE INTERFACE (HMI)

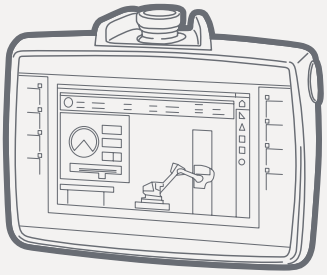
The hardware peripheral that runs customized software to facilitate human-to-machine interaction, the aptly named human-machine interface (HMI), provides a touchscreen and/or push-button display that can be connected directly to industrial PCs, programmable logic controllers, and distributed control systems. Many manufacturers leverage customized software to display production units and allow greater interaction with inputs and outputs.

SUB-APPLICATIONS

BASIC HMIs



ADVANCED HMIs

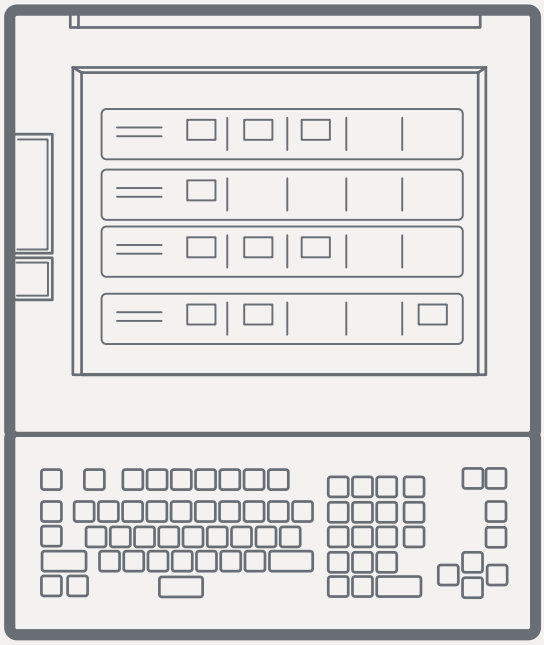


MOBILE HMIs

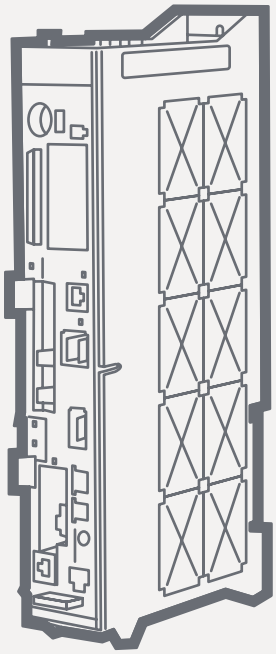
CNC CONTROLLERS

An industrial computer used to control metal cutting or forming of a work piece via a prestored program in the system's memory, the CNC controller is one of the most heavily used pieces of manufacturing equipment today. CNC controllers support computer-aided design (CAD) formats, such as STEP, DWG, and others, and they leverage hardware configurations to meet different use cases and their requirements for processing power, storage, and communication.

SUB-APPLICATIONS



METAL-CUTTING CONTROLLERS

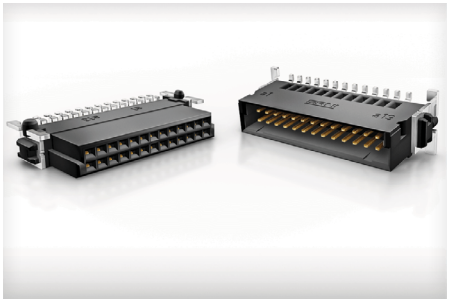


METAL-FORMING CONTROLLERS

PRINTED CIRCUIT BOARD (PCB) INTERCONNECTS

Our portfolio of PCB interconnects features high contact density to provide more reliable, high-speed connectivity over the lifetime of the machine. Benefits include: engineered for high signal integrity and high reliability, supports modular PCB setup, ultra compact to save space, and available in many configurations for enhanced design flexibility.

SMC CONNECTORS



Make reliable and compact connections with these connectors, which come in a variety of different mating configurations.

FEATURES:

- High-density compact design
- Differentiated double contact design to support reliable connections
- Bilateral differentiated welded bracket to provide high retention of PCB
- Compact lock design, easy to unlock and remove

Learn more:

SMC Connectors

MicroCon CONNECTORS

Highly resistant to vibration and shock, these extra-compact connectors are ideally suited for harsh industrial environments.

FEATURES:

- Extremely compact 0.8 mm pitch
- Reinforced outer wall for added reliability
- Available with 12–100 pins as well as straight and angled versions
- Includes SMT connections
- Current carrying capacity of 2.3 A per contact (at 20°C), with data rates of up to 3 Gbps

Learn more:

MicroCon Connectors

MicroBridge CONNECTORS

Made for the highest demands in the automotive industry, these connectors are super compact and super rugged.

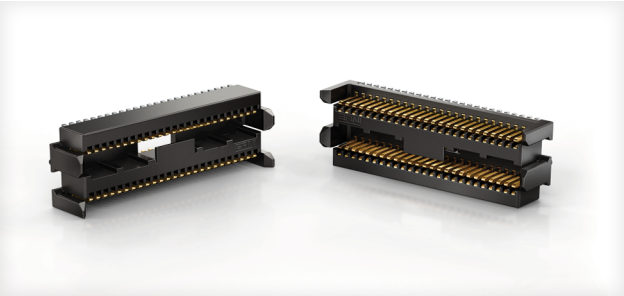
FEATURES:

- Compact cable connector system with 0.35 mm^2
- 2- to 20-pin possible (single-row)
- Optional electrical CPA (connector position assurance) for more secure and correct connections
- High temperature resistance of up to 150°C
- Compliant with LV214 automotive standards

Learn more:

MicroBridge Connectors

MicroStac CONNECTORS



With a pitch of just 0.8 mm, these connectors offer an economical solution for connections with high current rating and low connecting frequency.

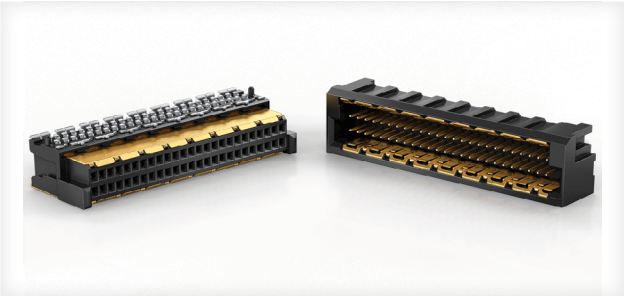
FEATURES:

- Hermaphroditic connector: identical male and female for reduced storage costs
- Anti-magnetic versions available
- Available 1- and 2-row versions for design freedom
- Different stacking heights

Learn more:

MicroStac Connectors

MicroSpeed CONNECTORS



Thanks to outstanding signal integrity, this connector system achieves high data transmission rates with proven reliability and robustness.

FEATURES:

- High signal integrity and external shielding allow for data rates up to 25 Gbps
- Flexible stacking heights (5–20 mm) and product variants allow for multiple PCB mating options
- Power module is available to support
- 18 A/contact
- High connector robustness is enabled through:
  - Dual-beam female contact
  - Blind mating capability
  - Polarization features
  - Shrouded housings

Learn more:

MicroSpeed Connectors

CONNECT WITH US.

Get answers to your questions now

We make it easy to connect with our experts and are ready to provide the support you need, including:

- Automation controls product information
- Discussions with TE engineers and product experts
- Project consultations
- TE design resources and tools

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BROCHURE

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