

A photograph of an industrial factory floor. In the foreground, a white car chassis is being assembled. Several orange robotic arms are visible, some holding parts of the car. The background shows a complex network of pipes, metal structures, and other machinery. The lighting is bright, typical of a factory environment.

# NETWORKED FACTORIES COUNT ON CONNECTIVITY

THAT'S WHY THE WORLD'S MOST ADVANCED  
MANUFACTURERS COUNT ON TE CONNECTIVITY

INDUSTRIAL COMMUNICATIONS

EVERY CONNECTION COUNTS



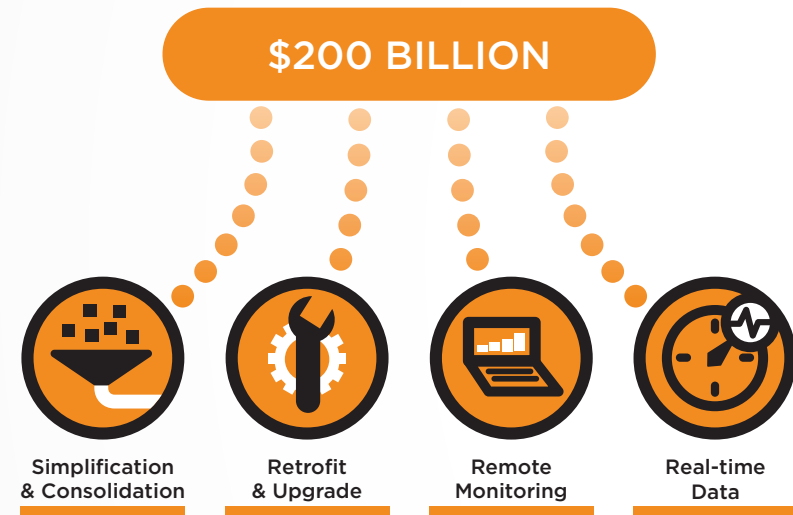
INDUSTRIAL

## GREATER PRODUCTIVITY COUNTS ON BETTER CONNECTIVITY.

Today, manufacturing has to be more of everything: more reliable, more automated, more flexible, more scalable, more decentralized. More connected. At TE Automation & Control, we deliver the innovative solutions to reliably connect, power and control the systems that make production more productive. From the circuit board to the harshest working environments, along the production floor and across the world, we make every connection count.

### MARKETPLACE TRENDS DRIVE GROWTH IN INDUSTRIAL AUTOMATION

Experts predict the global Industrial Automation market will grow to more than \$200 billion by 2015\*. At TE, we believe four key trends will not only contribute to this short-term growth, but will also spur the next evolutionary stage of development in Industrial Automation, known as Industry 4.0. TE offers connectivity solutions to help you capitalize on these expanding marketplace opportunities, as well as the emerging trends expected to drive the future of the industry.



### COUNT ON TE FOR HIGH PERFORMANCE NOW AND IN THE FUTURE

Not that long ago, a typical factory floor included equipment from a variety of manufacturers, each performing a specific task in the production process, and each with different protocols for doing so. Multiple technicians, with expertise in each protocol, were needed to operate the machines. Since the process lacked interoperability, a specialized communication bridge, capable of interpreting and communicating with each machine, was also required. A cumbersome resolution to be sure!

The demand for greater throughput and efficiency ultimately led to advances in factory automation, as well as the trend toward a common communication language. TE understood the need for reliable connectivity that delivered greater simplicity, efficiency and uptime—and embarked on an industrial communications and networking solution strategy to meet the most demanding requirements of manufacturers worldwide on the verge of Industry 4.0.

\* IMS Research, 2012.

### TE PRODUCTS HELP YOU COMPETE THROUGHOUT YOUR ENTIRE PRODUCTION ENVIRONMENT.

Networked manufacturing environments enable seamless communication, as well as greater speed and efficiency. In addition to data transfer among equipment on the factory floor, information must be shared throughout the entire production environment—extending beyond the industrial setting and onto desktops. Having access to real-time data regarding productivity and throughput empowers sound and immediate decision-making throughout your entire organization.

With a long history of cross-industry innovation and proven engineering expertise, TE is leading the charge to push the boundaries of efficiency and productivity—enabling simpler, faster and more economic industrial communications solutions.

“Our goal is to help our customers become market leaders, bringing them next generation technologies so they can, in turn, offer next generation products and solutions to their customers.”

Chris M. Zimmerman  
Sales Leader, Automation & Control, Americas



## TE'S INDUSTRIAL ETHERNET PRODUCTS PLAY A VITAL ROLE IN FACTORY AUTOMATION.

TE's industrial Ethernet products are widespread throughout today's networked factories, and play a critical role in driving the efficiency of many manufacturing processes. Used extensively in material handling equipment, our industrial communications solutions are also found throughout the automotive and food and beverage industries, as well as in the many manufacturing applications of industrial robots. With the development of smaller industrial Ethernet products, TE's solutions are also ideal for vision systems, common in security equipment and mail sortation devices.

### PROCESS CONTROL



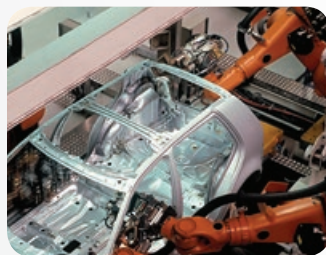
Process control enables mass production of repetitive processes typically involving the combination of one raw material with another, using a liquid to facilitate the process. TE industrial connectivity solutions are used in many process-intensive industries including converting sewage into clean, potable water; refining crude oil into petroleum; or transforming gold nuggets into bars.

### FOOD & BEVERAGE

TE industrial connectivity solutions are employed throughout the Food and Beverage industry. For example, in a beer bottling plant, industrial Ethernet directives control each step in the process—from washing, to drying, filling, capping and labeling each bottle. A programmable master controller synchronizes each move and communicates progress to the back office. Proven to perform consistently, TE's connectors can dramatically minimize failure and keep the production line moving.



### AUTOMOTIVE ASSEMBLY



TE's Industrial Communications solutions have made a significant impact in automotive assembly industry-wide. The complexity inherent in many inter-dependent steps makes our industrial Ethernet connectors especially invaluable in an environment where many different types of automation and robotic equipment—from riveting and welding to turning screws in dashboards—are synchronized in real time to avoid bottlenecks.

### ROBOTICS



TE's industrial connectivity solutions play a significant role in the growing field of robotics. The International Federation of Robotics reported a 38% increase in industrial robotics—the highest ever, with the automotive, food and beverage, metal and machinery industries all reporting robot orders above average. Whether human-sized for tasks like welding, or SCARAs used to insert pins in round holes without binding, or Cartesian for pick and place applications, TE's industrial connectors communicate to robots of all types and in many diversified environments.

### VISION SYSTEMS

While early machine vision systems were introduced more than three decades ago, the vision systems of today require miniaturized cameras, yet deliver significantly increased power and speed. TE offers a proprietary family of connectivity products, designed specifically for use in restricted spaces, with a 25% smaller footprint than other similarly performing products. Whether used in mail sortation or security cameras, our miniaturized industrial connectors are an ideal solution for vision systems—as they deliver the power and performance required, within significantly smaller spaces.



“ At TE, we have a breadth and depth of experience and capabilities that few others can claim. Many factors impact signal integrity on a factory floor—it's our understanding of the total environment that enables us to provide our customers with solutions that perform flawlessly in real-world applications. ”

Eric Leijtnens  
*Industrial Communications Platform Lead*

## FEATURES YOU EXPECT FROM THE WORLD LEADER IN CONNECTIVITY SOLUTIONS.

TE makes it a practice to maintain an inventory of preferred parts so orders can be fulfilled quickly. Even with specialty, or custom orders, we work to reduce lead times to facilitate effective solutions within the desired timeframe.

### FIELD INSTALLABLE

- Simple and flexible enough to be installed in seconds rather than minutes
- No need for tools or special expertise
- The entire installation process can be completed quickly, easily and by hand

### HIGH RELIABILITY

- Reliable performance even in the harshest industrial manufacturing environments
- Unparalleled longevity
- Eliminate the need for constant replacements and costly disruptions

### ROBUST

- Designed and constructed to withstand the most demanding and inhospitable environments
- Tolerates many hazards including dust, extreme temperature or humidity, and vibration
- Used with immersion in liquids, railways and military war zones

### EMI SHIELDING

- Protected from the interference of external electromagnetic radiation
- Ensures the constant flow of electricity
- Minimizes costly downtime

### COMMON CORE

- RJ 45 Connectors use a common core insert
- Interchangeable with plastic or metal housings or receptacles
- Enables maximum flexibility across many diverse applications

## TE'S INDUSTRIAL COMMUNICATIONS PRODUCTS

### INDUSTRIAL USB CONNECTORS

With over six billion USB ports installed globally, TE's industrial USB connectors are ideal for any industrial USB application requiring a high locking force or a sealed design. Features include:

- Integrated locking mechanism
- Audible & tactile feedback, to prevent accidental plug pullout
- USB2.0 transmission specification compliance
- Four solder connections
- Single- or double-row mating sockets, mountable on PCBs
- Socket & connector mountings: reflow soldering, surface mount, and surface mount with board locks
- A sealed version with a quick-connect bayonet coupling mechanism for harsher environments

### INDUSTRIAL RJ45 CONNECTORS

TE Industrial Ethernet RJ-45 connectors utilize a "common core" design for enhanced flexibility. Additional features include:

- Fast termination technology
- Field installable for IP20, ODVA & push-pull connectors
- Data transmission rates of 100 Mbit/s (4 pos.) up to 1000 Mbit/s (8pos.)
- Rugged locks
- Secondary locking with optional supporting frame

### INDUSTRIAL MINI I/O CONNECTOR

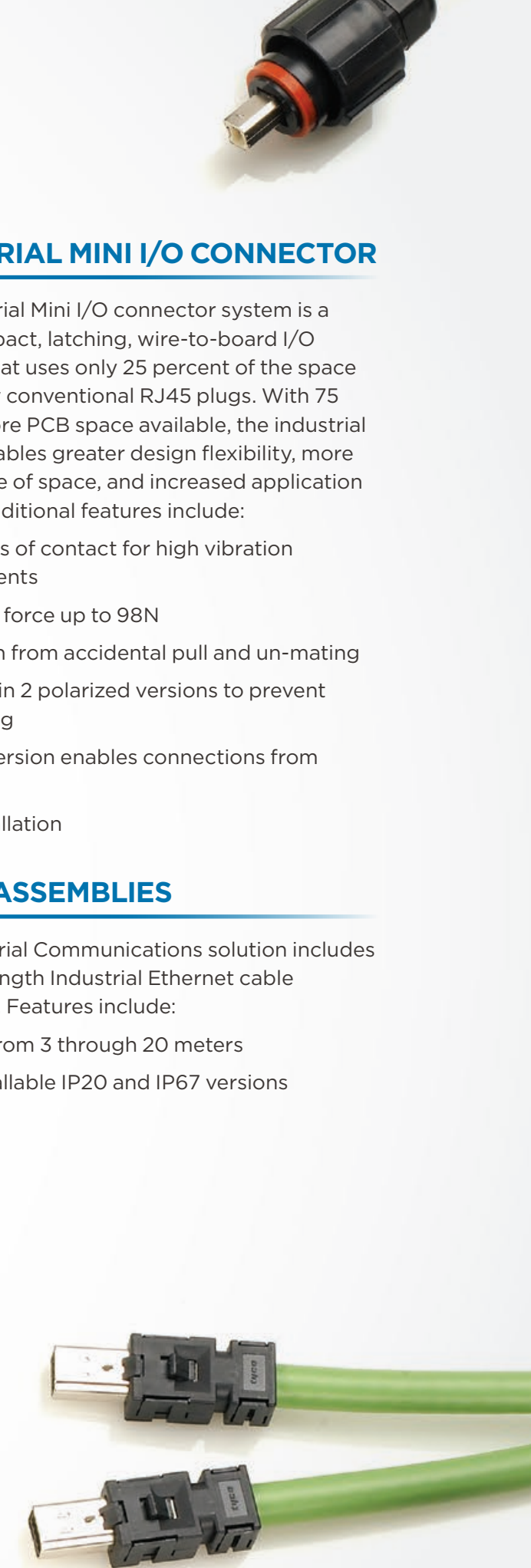
TE's Industrial Mini I/O connector system is a small, compact, latching, wire-to-board I/O interface that uses only 25 percent of the space required by conventional RJ45 plugs. With 75 percent more PCB space available, the industrial Mini I/O enables greater design flexibility, more efficient use of space, and increased application options. Additional features include:

- Two points of contact for high vibration environments
- Retention force up to 98N
- Protection from accidental pull and un-mating
- Available in 2 polarized versions to prevent mis-mating
- Vertical version enables connections from all angles
- Easy installation

### CABLE ASSEMBLIES

TE's Industrial Communications solution includes standard length Industrial Ethernet cable assemblies. Features include:

- Lengths from 3 through 20 meters
- Field installable IP20 and IP67 versions



# TE'S INDUSTRIAL COMMUNICATIONS PRODUCTS

TE Product Group

Connection Type

Environment

Housing Options

Application

Installation



## Industrial Mini I/O

Type I

Type II



## Industrial RJ45

Industrial Ethernet

ODVA (Variant 1)

CPC Product Family

Push/Pull (Variant 14)

Screw Type (Variant 3)



## Industrial USB Series

USB Latching IP20

Circular



## M8/M12

Panel Mount/Board Mount

Y-Adapters

Cable Assemblies

M8/M12 connector

Wire-to-Board

Wire-to-Wire

IP20

IP 65/67

Metal

Plastic

Push/Pull

Latching

Screw

1/4 Turn

Data

Signal

Field Installable

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## INDUSTRY 4.0 COUNTS ON CONNECTIVITY.

As hardware and systems become more advanced, the integration of electronics in industrial automation is becoming increasingly important. Embedding intelligence across the factory floor, for example, will ensure that all devices provide real-time data leading to an optimization of the Global Supply Chain. On the verge of Industry 4.0, the migration of more information technologies and applications in the field relies on the secure and predictable transport of data, signal and power. Industrial communications are key to a seamless integration of all devices and to the reliable transport of a large amount of data through the network. TE Connectivity recognizes this trend and our engaged teams partner with customers around the world to identify and solve their connectivity challenges—now and in the future.

“ In the factories of the future, intelligence needs to be available in all devices, resulting in a large amount of data that needs to be transported and communicated quickly and reliably. With our proven experience as a world leader in connectivity and our broad product and solution portfolio across many industries, TE Connectivity is uniquely positioned to be a thought leader and valuable partner to help turn our customers Industry 4.0 challenges into opportunities. ”

Ulrich Wallenhorst  
CTO TE Industrial



## YOUR PARTNER IN INDUSTRIAL COMMUNICATIONS.

The unique demands of today's networked manufacturing facilities count on reliable connectivity solutions to deliver performance—and to do so faster, more economically and within increasingly smaller spaces. Count on TE Connectivity to deliver all this in your most environmentally demanding industrial applications.



### INCREASE SPEED AND ACHIEVE GREATER THROUGHPUT

With faster load rates, enhanced information flow and deterministic networks.



### IMPROVE QUALITY WITH GREATER CONTROL OVER QA

With finer levels of detail and resolution from machine inspection.



### GAIN ECONOMIES OF SCALE AND ACHIEVE MULTIPLE COST REDUCTIONS

With more universal and available parts and without the need for proprietary equipment.



### GET MORE POWER IN A SMALLER PACKAGE

With increasingly capable devices in a space-saving footprint.



### ATTAIN THE ULTIMATE FLEXIBILITY

With TE's common core design.



### INCREASE RELIABILITY

With the most ruggedized industrial connectors.



### ENGINEERING EXCELLENCE DELIVERS SMARTER, FASTER SOLUTIONS TO YOUR MOST COMPLEX PROBLEMS

With 7,400 field engineers in nineteen global design centers.

# 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  
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