

# SOLUTION GUIDE FOR TERMINALS & CONNECTORS

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PREPARE FOR EVERY CHALLENGE FOR THE MOST RUGGED APPLICATIONS



“Our customer-focused mindset and commitment to innovation help us to provide exceptional value while fulfilling your needs.”

**JEAN-MICHEL RENAUDIE**

Senior Vice President and  
General Manager ICT Business Unit

# HIGHLY RUGGEDIZED SOLUTIONS FOR SOME OF **YOUR TOUGHEST JOBS**

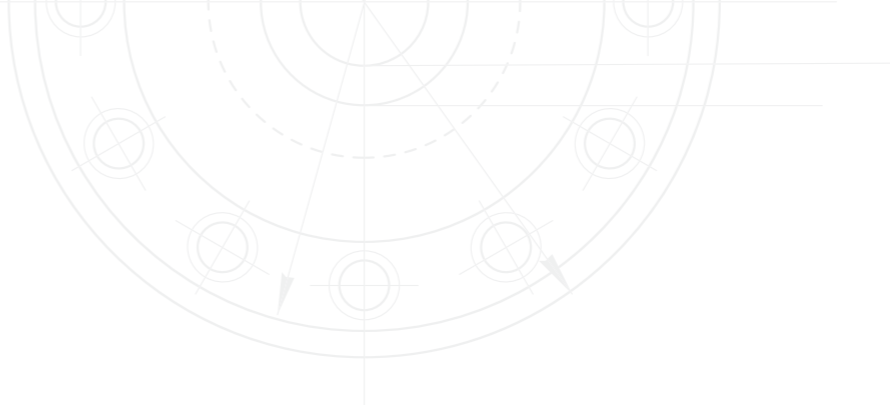
When failure is not an option, TE Connectivity (TE) can be counted on to provide time-tested connectivity technology for rugged environments - from truck and bus, to construction, agriculture and other extreme applications.



With us, you can rest assured that you are getting access to a global footprint and a full set of solutions - including our industry-proven DEUTSCH portfolio. Our products power industry applications in harsh environments the world over - that's why we've been the supplier of choice for original equipment manufacturers (OEMs) and maintenance, repair, and overhaul (MRO) organizations for over 40 years.

And it is not only our parts that you can trust - you can also rely on our people as capable, committed and caring partners. We have a long history, decades of significant experience and a market-leading position - coupled with a broad portfolio and rigorous design expertise.

This is what empowers you to build upon TE's innovation - as we help you to meet future trends, so your own customers can withstand tough conditions across most applications. But just how challenging are these demands and conditions to overcome? Let's discuss this further.



**There are two principal differences which set ICT connectivity applications apart from passenger vehicles. Firstly, the harsh operating conditions and applications that ICT vehicles are subjected to are much more severe than those experienced by passenger vehicles. Secondly, the consequences of a failed connection in a commercial or industrial setting are potentially far more costly.**

Taking all of this into account, the terminals and connectors you select must withstand the dirt, moisture, salt, shock and vibrations that are endemic to long-haul operation and industrial sites. In addition, they must also support high power connections, high speed data communications and a high number of mating cycles. Underhood applications operate at extreme temperatures, which require connectivity solutions well beyond those of passenger cars – and at the same time, there is demand for high reliability, as well as systems that can improve safety and efficiency.

Interrupted or failed connections can lead to lost time, reduced productivity and profitability, increased repair and maintenance costs, and compromised safety – all of which ultimately results in dissatisfied customers.

That’s why TE is developing innovative and reliable connectivity and sensing products that are designed to withstand harsh environments in heavy-duty truck, bus, construction, agricultural and other industrial and off-highway applications – where failure is not an option.

# TRUST US TO SOLVE YOUR SPECIFIC INDUSTRY CHALLENGES

**The harsh environments where industrial and commercial vehicles operate demand rugged and robust connection systems, on which the sector can depend.**

Features that have recently made their way into passenger cars are becoming basic customer requirements, and are now broadly implemented into industrial vehicles as well. For example, adaptive braking and steering, onboard diagnostics, vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) data communication, and cameras that provide a 360-degree angle of environments.

Only ICT-focused teams can understand these needs, and design solutions specific for your applications.

## CHALLENGES WE HELP YOU SOLVE

- High power (voltage and current)
- High speed data communications
- Electromagnetic compatibility (EMC)
- Accessibility/serviceability/Ease of assembly
- Touch-safe-operation
- Miniaturization
- Larger, heavier cabling and power connections for the electrification architecture
- Blind mating/Ergonomic handling
- Connection integrity/Contact alignment and retention
- High number mating cycle in an abrasive environment



# TRUCK

## DEVELOPING ROBUST CONNECTIVITY SOLUTIONS FOR THE NEXT GENERATION OF VEHICLES

Trucks that travel long distances and are continually in service can experience some of the most wide-ranging conditions imaginable, and failure is not an option when consignments need to be delivered on time. Extremes for operating environments can be as low as -40°C and as high as +150°C, but the components which keep them running must be able to withstand this with ease. They must also be dust-tight to guard against solid particles, and able to resist liquid intrusion - including regular intensive cleaning using powerful high-temperature water jets.

TE is continually investing in new technologies to confirm that our terminal and connector products can withstand these types of high power and high-pressure applications. Our ruggedized electrical and data connector systems use specialist technology which has been developed for the electric passenger vehicle market. This gives our trucking industry customers confidence that our products can stand up against harsh environmental elements and keep them at the forefront of their industry.

### KEY APPLICATIONS

- Cabin
- Bulkhead
- Engine & After-Treatment
- Chassis
- Transmission

### CABIN

- Unsealed Interconnection System
- DEUTSCH DT/DTM/DTP Connectors
- DEUTSCH HD 10 Connectors

### BULKHEAD

- Heavy Duty Sealed Connector Series
- LEAVYSEAL Connectors
- DEUTSCH HDP Connectors
- DEUTSCH DRB Connectors
- Unsealed Interconnection System

### ENGINE & AFTER-TREATMENT

- Heavy Duty Sealed Connector Series
- LEAVYSEAL Connectors
- DEUTSCH DT/DTM/DTP Connectors
- DEUTSCH HDP Connectors
- DEUTSCH HD 10 Connectors
- DEUTSCH DRC Connectors
- Sensor Flat Connectors
- Circular & DIN Connectors
- ECU Headers & Plugs
- Cylinder Head Wiring

### CHASSIS

- Heavy Duty Sealed Connector Series
- LEAVYSEAL Connectors
- DEUTSCH DT/DTM/DTP Connectors
- SUPERSEAL pro Connectors
- DEUTSCH HDP Connectors
- DEUTSCH DRB Connectors
- NTSEAL Connectors
- Circular & DIN Connectors

### TRANSMISSION

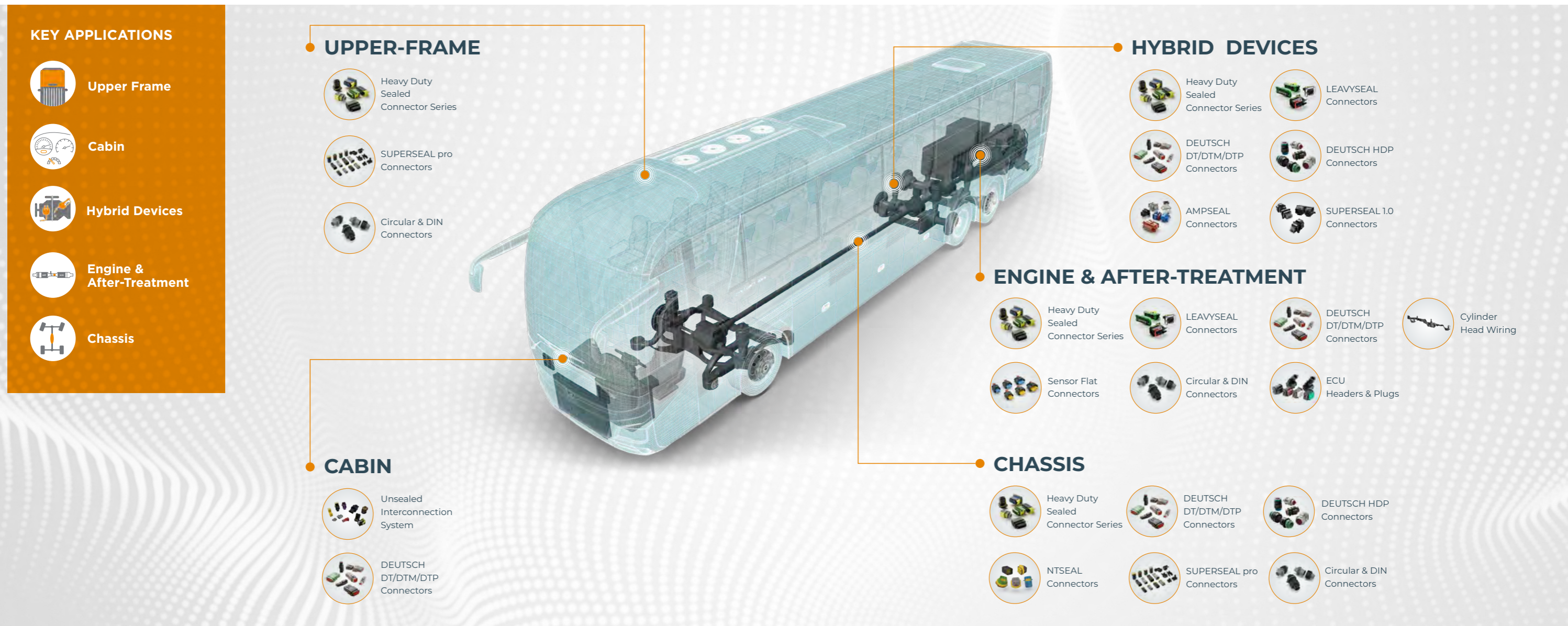
- Heavy Duty Sealed Connector Series
- LEAVYSEAL Connectors
- DEUTSCH DT/DTM/DTP Connectors
- AMPSEAL Connectors
- SUPERSEAL 1.0 Connectors

# BUS

## PROVIDING SERVICE RELIABILITY AND SAFETY IN A **RAPIDLY DEVELOPING ENVIRONMENT**

To enable an efficient transport system, operators need to provide public transport service reliability as well as real-time service information for customers. TE's terminal and connectors provide robust and flawless power and signal connectivity, to confirm the future of bus transportation. Our broad portfolio, which has a track record of solid product performance, can be trusted to successfully get passengers to their final destination in a safe and efficient manner.

Our products are meticulously validated and tested in our laboratories, using techniques that push them to physical and safety-critical limits usually reserved for aerospace and industrial applications. Bus manufacturers can have complete confidence in our products, and in the safety and security of the passengers inside the vehicle.



# CONSTRUCTION

## EMPOWERING EQUIPMENT RELIABILITY IN THE HARSHTEST OF CONDITIONS, TODAY AND TOMORROW

Construction sites are some of the harshest environments in which equipment and machinery must operate. These types of projects also typically work to very tight schedules, and should a vital piece of equipment or machinery fail, the time and cost implications can be huge. Entire projects can be held up until a replacement part is delivered - a process which could take days, depending on geography or global supply issues.

TE's connectivity solutions are built to withstand environments where dirt, dust, moisture, salt spray, heavy vibration, extreme temperatures and rough terrain can damage electrical connections. Our DEUTSCH portfolio is time tested and field-proven, offering sealed connectors that meet the tough requirements of the construction industry around the world.

**KEY APPLICATIONS**

- Swing Arm
- Hydraulics
- Chassis
- Telematics
- Cabin
- Engine & After-Treatment

**SWING ARM**

- DEUTSCH DT/DTM/DTP Connectors
- AMPSEAL 16 Connectors

**HYDRAULICS**

- DEUTSCH DT/DTM/DTP Connectors
- AMPSEAL 16 Connectors

**CHASSIS**

- DEUTSCH DT/DTM/DTP Connectors
- DEUTSCH HDP Connectors
- DEUTSCH DRB Connectors
- DEUTSCH DRC Connectors
- AMPSEAL 16 Connectors
- Heavy Duty Sealed Connector Series
- Circular & DIN Connectors
- LEAVYSEAL Connectors
- NTSEAL Connectors

**TELEMATICS**

- DEUTSCH DT/DTM/DTP Connectors
- AMPSEAL Connectors
- DEUTSCH DRC Connectors
- SUPERSEAL 1.0mm Connectors
- EEC Enclosures

**CABIN**

- DEUTSCH DT/DTM/DTP Connectors
- Heavy Duty Sealed Connector Series
- Unsealed Interconnection System
- AMPSEAL 16 Connectors
- DEUTSCH DRB Connectors
- LEAVYSEAL Connectors
- AMPSEAL Connectors
- SUPERSEAL 1.0 Connectors

**ENGINE & AFTER-TREATMENT**

- DEUTSCH DT/DTM/DTP Connectors
- Heavy Duty Sealed Connector Series
- DEUTSCH HDP Connectors
- NTSEAL Connectors
- DEUTSCH DRB Connectors
- AMPSEAL 16 Connectors
- DEUTSCH DRC Connectors
- Circular & DIN Connectors

# AGRICULTURE

## MEETING THE CONNECTIVITY NEEDS OF THE FARMING INDUSTRY AS TECHNOLOGY EVOLVES

Three critical factors for agriculture are seasonal timing, high productivity and maximum safety. If a machine fails and critical windows are missed, lower yields and a loss of productivity will result, leading to severe cost implications. A critical system failure could even result in serious injury or death. In addition, as technology advances, more sophisticated applications such as automatic harvesting are also becoming increasingly commonplace, adding an even higher level of reliance on the technological aspects of farm machinery.

The extreme nature of rural environments means that water leakage and signal degradation are a common issue with inbound connections. TE has more than 75 years of connectivity experience and over 30 years of experience in the industrial and commercial transportation connectivity segment. This enables us to develop an extensive portfolio of robust and reliable solutions which can be trusted to perform, helping machinery manufacturers stay one step ahead.

**KEY APPLICATIONS**

- Telematics**
- Cabin**
- Chassis**
- Engine & After-Treatment**

**TELEMATICS**

- DEUTSCH DT/DTM/DTP Connectors
- DEUTSCH DRC Connectors
- SUPERSEAL 1.0mm Connectors
- AMPSEAL Connectors

**CABIN**

- DEUTSCH DT/DTM/DTP Connectors
- DEUTSCH HDP Connectors
- DEUTSCH HD 10 Connectors
- NTSEAL Connectors
- Unsealed Interconnection System
- AMPSEAL Connectors
- SUPERSEAL 1.0mm Connectors
- AMPSEAL 16 Connectors

**CHASSIS**

- DEUTSCH DT/DTM/DTP Connectors
- DEUTSCH HDP Connectors
- DEUTSCH HD 10 Connectors
- DEUTSCH DRB Connectors
- DEUTSCH DRC Connectors
- Heavy Duty Sealed Connector Series
- LEAVYSEAL Connectors
- NTSEAL Connectors
- Circular & DIN Connectors
- AMPSEAL 16 Connectors

**ENGINE & AFTER-TREATMENT**

- DEUTSCH DT/DTM/DTP Connectors
- DEUTSCH HDP Connectors
- DEUTSCH DRB Connectors
- DEUTSCH DRC Connectors
- Heavy Duty Sealed Connector Series
- LEAVYSEAL Connectors
- NTSEAL Connectors
- Sensor Flat Connectors
- Circular & DIN Connectors
- ECU Headers & Plugs

# OTHER RUGGED APPLICATIONS

## MINIMIZING DANGER AND RISK OF MALFUNCTION IN EXTREME ENVIRONMENTS

Vehicles like powerboats, snowmobiles and forklifts are often either traveling at speed or carrying heavy materials. Safety is therefore the number one priority – if a powerboat’s propulsion system fails while moving at high speed, the consequences could be fatal. Likewise, a forklift cutting out and dropping significant loads could be equally as disastrous, as well as costly to business.

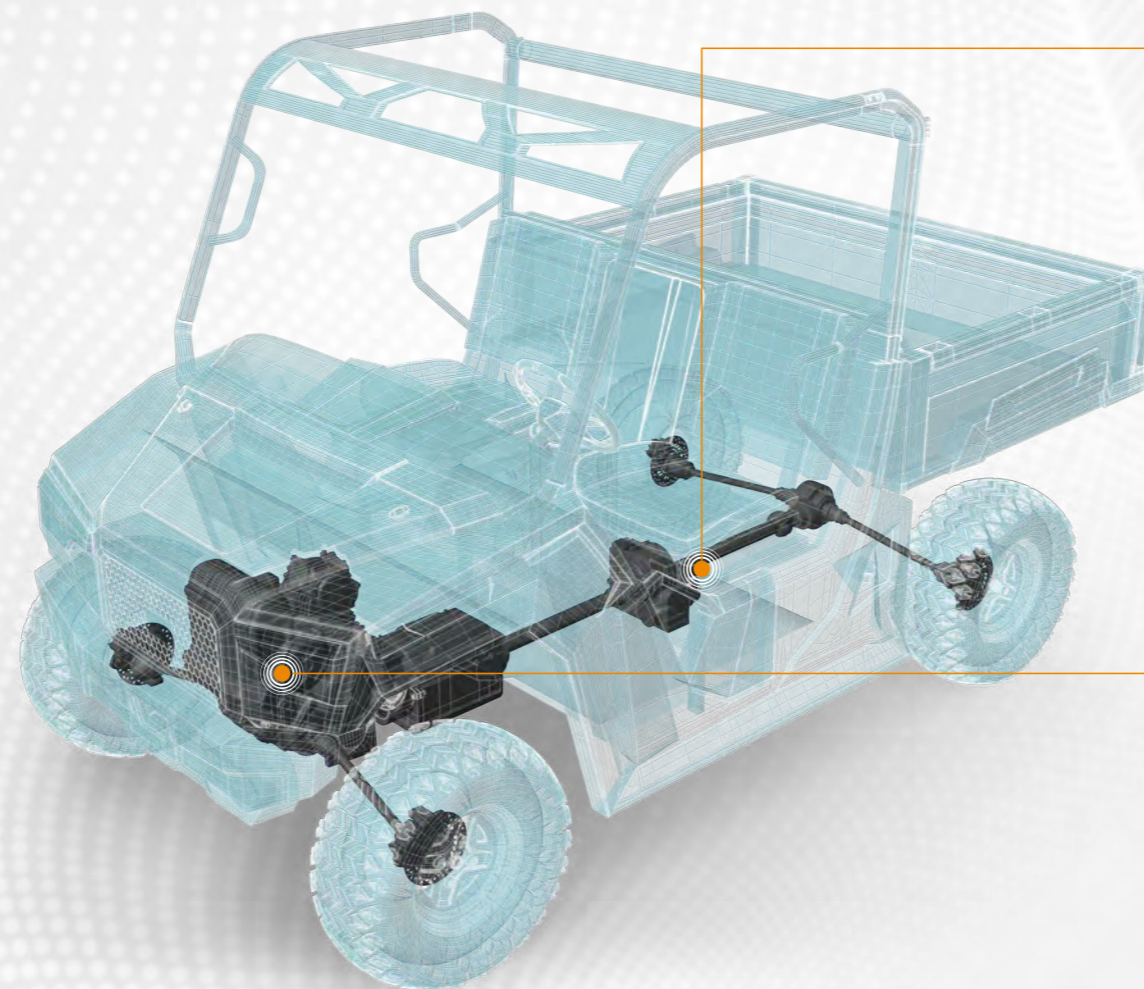
To minimize the risk of malfunction in environments like these, where failure is not an option, we design early prototypes of our connectivity solutions to meet extremely harsh and challenging requirements, which are later tested and examined to a high degree.

**KEY APPLICATIONS**

- In-line/Chassis
- Engine/Machine Control

**RUGGED APPLICATIONS**

- Forklift
- Utility Vehicles
- Snowmobile/ATV
- Lawn and Turf Equipment
- Recreational



### IN-LINE / CHASSIS

- Heavy Duty Sealed Connector Series
- DEUTSCH DT/DTM/DTP Connectors
- NTSEAL Connectors
- Circular & DIN Connectors

### ENGINE / MACHINE CONTROL

- LEAVYSEAL Connectors
- AMPSEAL Connectors
- SUPERSEAL 1.0 Connectors
- Circular & DIN Connectors





# A DIVERSIFIED AND RELIABLE PORTFOLIO

We offer a large range of products and accessories that provide the versatility to cover most applications in critical environments, so our clients' customers are prepared for every challenge.

As more functions have to be integrated into the vehicle, more components need to fit within the same amount of space - which leads in turn to the need for product designers to consider requirements for miniaturization.

And as terminals and connectors need to become smaller, more positions to insert terminals and transmit power are required - while the ability for them to operate in higher density configurations is also vital.

Our broad array of reliable and innovative products answers these demands and covers some 13,500 items within the portfolio.

## LEAVYSEAL CONNECTORS



The LEAVYSEAL connector series is a family of high-density lever-assisted connector housings for bulkhead/pass-thru and module applications. LEAVYSEAL products utilize a lever lock system for mating and are available in several mounting styles and keying options.

**APPLICATION:** Motor & gearboxes, ABS/EBS brake units, actuators, bulkhead, fuse & relay boxes, e-Motor, chassis, EV-battery, lighting, wire-to-wire, wire-to-board  
**SIZES:** 7 Sizes with 15 - 120 positions  
**WIRE RANGE:** 6.00 - 0.20 mm<sup>2</sup>  
**RATINGS:** -40°C to +140°C | IP69K (with cover) | PBT GF30 | UL94 V-0 (opt.)

## HEAVY DUTY SEALED CONNECTOR SERIES

The Heavy Duty Sealed Connector Series is a comprehensive family of connector housings for a broad range of heavy-duty applications with high current capacity. It can be used in very harsh environments for inline or flange-mounted applications in a wire-to-wire or wire-to-device configuration.

**APPLICATION:** Motor & gearboxes, ABS/EBS brake units, hydraulic pumps, actuators, switches, sensor, wire-to-wire at the chassis  
**SIZES:** 5 Groups with 2 to 18 position  
**WIRE RANGE:** 6.00 - 0.20 mm<sup>2</sup>  
**RATINGS:** -40°C to +140°C | IP69K (with cover) | Glass-filled PBT | UL 94 V-0



## AMPSEAL CONNECTORS



AMPSEAL connectors provide rugged reliability, ease of use, and advanced environmental sealing in heavy-duty wire-to-board applications. These connectors are engineered to withstand extreme temperature and moisture, including high-temperature underhood applications.

**APPLICATION:** Sealed wire-to-board interconnect  
**SIZES:** 8, 14, 23, and 35 positions  
**WIRE RANGE:** 16-24 AWG (1.25 - 0.20 mm<sup>2</sup>)  
**RATINGS:** -40°C to +125°C | IP67 / IP 69 with backshells | UL94 V-0

## UNSEALED INTERCONNECTION SYSTEM

The Unsealed Interconnection System includes an extensive range of unsealed, rugged and flexible connectors - specifically designed for inside-cabin, bulkhead and control-unit applications of on- and off-road vehicles.

**APPLICATION:** Bulkhead, in-cabin, control unit, fuse & relay box, power distribution, wire-to-wire, wire-to-board  
**SIZES:** 1 to 48 position  
**WIRE RANGE:** 16.00 - 0.20 mm<sup>2</sup>  
**RATINGS:** -40°C to +120°C | IP30 | PA66/PBT | UL94 V-0 (optional)



## SUPERSEAL PRO CONNECTORS



Using the proven MCON 1.2 SWS terminal with a 17 A-current carrying capacity, SUPERSEAL pro 2-, 3-, and 4-position sealed connectors provide a vibration resistance that complies with USCAR V2. With pre-assembled and color-coded TPA options, SUPERSEAL pro's integrated front seal housing design improves terminal retention and allows easy assembly.

**APPLICATION:**  
Wire-to-wire, panel/bulk, chassis  
**SIZES:** 2,3,4 position  
**WIRE RANGE:** 14-20 AWG (2.0-0.5 mm<sup>2</sup>)  
**RATINGS:** -40°C to +125°C | IP67, IP68, and IP69K (with cover)

## SUPERSEAL 1.0 MM CONNECTORS

SUPERSEAL 1.0 mm connectors are designed for high density printed circuit board applications – providing rugged reliability and accepting 1.0 mm contacts, carrying up to 15 amps. They are available in 26, 34, 44 and 60-way arrangements with straight or right-angle pins and have an integrated latch for mating.

**APPLICATION:**  
Sealed wire-to-board interconnect  
**SIZES:** 26, 34, 44 and 60 positions Header (60 Positions Header mates with one 26 positions Plug + one 34 positions Plug)  
**WIRE RANGE:** 16-20 AWG (1.25 - 0.50 mm<sup>2</sup>)  
**RATINGS:** -40°C to +125°C | JIS D0203



## SENSOR FLAT CONNECTORS



Aimed at providing high reliability and performance in harsh conditions, Sensor Flat 2-, 3- and 4- position are ISO 16750-3 Test I, IP67 and IP6K9K sealing rated – specifically designed to meet high vibration and temperature resistance demands placed on connectors, used in modern engines.

**APPLICATION:**  
Wire-to-wire, engine  
**SIZES:** 2, 3, 4 position  
**WIRE RANGE:** 14-20 AWG (2.0-0.5 MM<sup>2</sup>)  
**RATINGS:** -40°C to +125°C | IP67, IP68, and IP69K (with cover)

## CIRCULAR & DIN CONNECTORS

Circular & DIN connectors are a sealed, circular connector solution, using round contacts and offering flexibility for a wide range of applications. They are designed to meet the vibration, sealing, and longevity requirements imposed by demanding conditions, found in the industrial and commercial vehicles market.

**APPLICATION:**  
Sealed wire-to-wire interconnect  
**SIZES:** 2-7 and 31 positions  
**WIRE RANGE:** 16-20 AWG (2.5 - 1.55 mm<sup>2</sup>)  
**RATINGS:** -40°C to +120°C | ISO 15170/DIN 72585



## DEUTSCH CONNECTORS

These versatile connectors are ideal for rugged applications where relentless vibration, temperature and water extremes are experienced over a long service life. They are based on our proven DEUTSCH system which features durable contacts, watertight seals, rugged metal or thermoplastic shells and a firm, secure locking mechanism.

With round pins and sockets, these connectors offer multiple contact points and high-quality crimps that provide reliable, low-impedance power and signal data transmission. They are available in a variety of configurations to meet specific application requirements.

## DEUTSCH DT CONNECTORS SERIES



DEUTSCH DT, DTM, and DTP environmentally sealed connectors are designed for wire-to-wire and wire-to-board applications. The DT connectors are used in harsh environment applications where even a small degradation in connection may be critical.

**APPLICATION:**  
Sealed wire-to-wire, wire-to-board  
**SIZES:** 2, 3, 4, 6, 8, and 12 positions  
**WIRE RANGE:** 14-20 AWG (2.50 - 0.50 mm<sup>2</sup>)  
**RATINGS:** -55°C to +125°C | IP67, IP68, IP69K (with rear protection, such as backshell)

## DEUTSCH 2 AND 3 POSITION DT SNAP-CAP SEALED CONNECTORS WITH LATCH LOCK (NEW)

DEUTSCH 2 & 3 position DT snap-cap sealed connectors with latch lock improves interface performance with latch-lock feature to prevent un-intentional latch operation and make reliable connections.

**APPLICATION:**  
Sealed wire-to-wire, wire-to-board  
**SIZES:** 2, 3 position  
**WIRE RANGE:** 14-20 AWG (2.50 - 0.50 MM<sup>2</sup>)  
**RATINGS:** -55°C to +125°C | IP67, IP68, IP69K (with rear protection, such as heat shrink turbings)



## DT-XT SEALED CONNECTORS



The DT-XT connector system provides advanced seal materials, offering greater flexibility and improved tear resistance, with a rear seal cover to protect against water ingress.

**APPLICATION:**  
Wire-to-wire connectors  
**SIZES:** 2, 3, 4, 6, 8, 12 and 18 positions  
**WIRE RANGE:** 14-20 AWG & 20-24 AWG  
**RATINGS:** -55°C to +125°C | IP67, IP68, IP69K (with rear protection, such as backshell)

## DEUTSCH HD10 CONNECTOR SERIES



The HD10 series is an environmentally sealed, thermoplastic, and cylindrical connector series. HD10 connectors are heavily used for diagnostic applications and are available with or without a coupling ring.

**APPLICATION:**  
Sealed wire-to-wire, inline/panel mount  
**SIZES:** 3, 4, 5, 6, and 9 positions available  
**WIRE RANGE:** 6-20 AWG (16.00-0.50 mm<sup>2</sup>)  
**RATINGS:** -55°C to +125°C | IP67, IP68, IP69K (with cover)

## DEUTSCH DRC CONNECTOR SERIES



DEUTSCH DRC connectors are designed for high-pin count, harsh environment applications. These environmentally sealed, rectangular shaped connectors are offered with several mounting options including in-line, flange mount, and PCB mount.

**APPLICATION:**  
Sealed wire-to-wire, wire-to-board  
**SIZES:** 24, 40, 50, 60, 64, and 70 positions  
**WIRE RANGE:** 14 - 22 AWG (2.50 - 0.35 mm<sup>2</sup>)  
**RATINGS:** -55°C to +125°C | IP67, IP68, IP69K (with cover)

## DEUTSCH HD30 & HDP20 CONNECTOR

The rugged thermoplastic DEUTSCH HDP20 connectors and the heavy-duty aluminum HD30 connectors are environmentally sealed connectors with 19 different contact arrangements – with a mix of signal and power circuits.

**APPLICATION:**  
Sealed wire-to-wire, inline/panel mount  
**SIZES:** Up to 47 positions  
**WIRE RANGE:** 4-22 AWG (13.00 - 0.35 mm<sup>2</sup>)  
**RATINGS:** -55°C to +125°C | IP67, IP68, IP69K (with cover)



## DEUTSCH DTHD CONNECTOR SERIES

DEUTSCH DTHD connectors are single terminal connectors for heavy duty applications. Easy to install, environmentally sealed and compact in size. DTHD connectors are available in three sizes, carry 25 to 100 amps, and can be mounted or used in-line.

**APPLICATION:**  
Sealed inline or flange mount  
**SIZES:** 1 position  
**WIRE RANGE:** 6-14 AWG (16.00 - 2.00 mm<sup>2</sup>)  
**RATINGS:** -55°C to +125°C | IP68, IP69k



## NTSEAL SEALED CONNECTORS



NTSEAL connectors are an expanding family of in-line and through panel connectors, using the trusted DEUTSCH common contacts. NTSEAL connectors offer improved mating ergonomics, integrated Terminal Position Assurance (TPA) and Connector Position Assurance (CPA).

**APPLICATION:**  
Wire-to-wire, panel/bulkhead mount, engine, chassis  
**SIZES:** 20, 48 position hybrid  
**WIRE RANGE:** 14-20 AWG (2.0-0.5 mm<sup>2</sup>)  
**RATINGS:** -40°C to +125°C | IP67, IP68, and IP69K (with cover)

## DEUTSCH DTSK CONNECTOR SERIES



DEUTSCH DTSK connectors are easy-to-use, single-pole connectors designed for power applications. These heavy-duty connectors feature latch-style mating and an integrated secondary lock and accept size Ø8 mm contacts that are rated up to 125 amps.

**APPLICATION:**  
Sealed wire-to-wire  
**SIZES:** 1 position  
**WIRE RANGE:** 2 - 4 AWG, (25.00 - 35.00 mm<sup>2</sup>)  
**RATINGS:** -55°C to +125°C | IP67, IP68, IP69K (with cover)

## DEUTSCH DRB CONNECTOR SERIES

The DEUTSCH DRB series is a heavy-duty connector series suitable for bulkhead applications in harsh environments. To increase the design flexibility, the DRB series offers several mounting flange options and wire arrangements.

**APPLICATION:**  
Sealed wire-to-wire, bulkhead  
**SIZES:** 48, 60, 102, and 128 positions  
**WIRE RANGE:** 6-22 AWG (16.00 - 0.35 mm<sup>2</sup>)  
**RATINGS:** -55°C to +125°C | IP67, IP68, IP69K (with cover)



## DEUTSCH SEALED PCB ENCLOSURES

Printed Circuit Board (PCB) connectors are heavy-duty environmentally sealed connectors designed for wire-to-circuit board connections. Available in a variety of styles from different connector families, PCB connector bodies will withstand dust, dirt, moisture, and vibration.

**APPLICATION:**  
Sealed wire-to-board  
**SIZES:** 12, 24, 36, and 48 positions  
**WIRE RANGE:** 14-20 AWG (2.50 - 0.50 mm<sup>2</sup>)  
**RATINGS:** -55°C to +125°C | IP68



## AMPSEAL 16 CONNECTORS

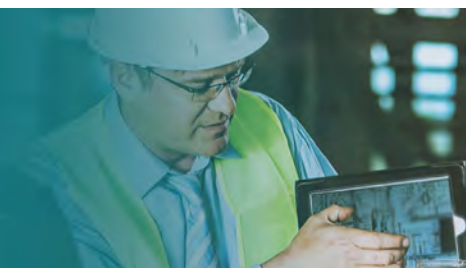


AMPSEAL 16 hybrid lever is a sealed connector system that features a lever slide mechanism for mating and a slide-in mounting clip. The mix of 24 x size 16 and 4 x size 12 terminals creates design flexibility for use in various vehicle applications.

**APPLICATION:** Sealed wire-to-wire interconnect  
**SIZES:** 28 positions  
**WIRE RANGE:** 10-20 AWG (6.00-0.50 mm<sup>2</sup>)  
**RATINGS:** -55°C to +125°C | IP67 | UL94HB

## APPLICATION TOOLING

From prototyping, wire harness assembly and field repairs to higher volume production, TE application tooling offers a range of solutions that deliver reliable crimp connections for heavy-duty equipment and commercial vehicles.



## AMPSEAL 16 HIGH TEMPERATURE CONNECTORS

The AMPSEAL 16 high temperature connector is the addition to the well-established AMPSEAL 16 connector product portfolio - built to withstand extreme heat conditions of up to 150°C and a higher flammability rating of UL94 V-0 in on-engine, aftertreatment and powertrain applications.

**APPLICATION:** Wire-to-wire and wire-to-device  
**SIZES:** 2, 3, 4, 6, 8, and 12 positions  
**WIRE RANGE:** 2 - 4 AWG, (25.00 - 35.00 mm<sup>2</sup>)  
**RATINGS:** Up to 150° increased temperature | UL94 V-0 | IP67, IP68, and IP69K (with rear protection, such as backshell) J2030 power-wash tested



## INSERTION & EXTRACTION TOOLS

Our tooling is designed to insert and extract terminals from connector housings, without damaging the terminal or housing. Available standard or customized, TE tool kits are equipped to carry out precision tasks to a high professional standards.



## AMPSEAL 16 MINI LEVER CONNECTORS



The innovative AMPSEAL 16 mini lever connectors from TE features an ergonomic lever lock mating system and a tool-free mounting design to eliminate the need for additional parts.

**APPLICATION:** Wire to wire, bulkhead and pass-through applications  
**CONTACT SYSTEM:** DEUTSCH stamped & formed size 12 and 20 pin and socket terminals and AMPSEAL 16 heavy duty stamped & formed (HDSF) size 16 pin and socket terminals.

## PORTABLE CRIMP TOOLS

A wide variety of portable crimp tools are available, including manual and power assisted options. Our Standard Die Envelope (SDE) dies are also interchangeable between manual, pneumatic or battery-powered tools.



## APPLICATORS

TE OCEAN 2.0 applicators are designed to crimp a wide range of terminals. Crafted from high grade tool steels and processed through advanced CNC equipment for tight tolerances, our applicators are engineered for high repeatability and fast throughput.



## BENCHTOP WIRE CRIMPING MACHINES

Our benchtop wire crimping machines deliver flexibility, performance and reliability for low to medium volume wire processing – with a CQM II Crimp Quality Monitor for an added layer of quality control, complete with crimp detection analysis.





## WHY CHOOSE TE?

### UNRIVALLED ENGINEERING EXPERTISE FOR MAXIMUM ADVANTAGE

Our engineering excellence, global scale and uncompromising quality combine to provide an unparalleled advantage.

By linking and leveraging across our company, our customer-focused engineers can draw upon the knowledge and experience of colleagues across the globe to solve specific industry challenges - teaming up to deliver valuable engineering expertise, from start to finish.

We participate in various standards committees and industry consortia, enabling us to address problem solutions early in the process. Plus, we also invest extensively in upfront R&D, seeking to collaborate on solving tough industry challenges before they become problems. While our design engineers focus on meeting or exceeding your connectivity requirements, we don't just stop there.



#### OUR CAPABILITIES

- **Concept designs**
- **CAD/CAE**
- **Material R&D**
- **Process/automation design**
- **Prototyping**
- **Product validation**
- **3D prints**
- **Hard metals**
- **SLA prototypes**
- **Cable assembly**



### RELY ON US TO SPEAK YOUR TECHNICAL LANGUAGE

By investing in system knowledge, we confirm our solutions match the demands of the application, to support you across your entire product lifecycle.

Not only does TE encourage collaboration between engineers and scientists, we also have a team of innovative and highly capable Field Application Engineers (FAEs) who are deployed to deliver the 'voice of the customer' to our component design teams - as well as using their knowledge and experience to leverage the technical power of TE on your behalf.

FAEs are experts at supporting you to enable your success, working closely with you to solve industry challenges, and to develop robust terminal and connector solutions that meet your exact needs - from prototyping to production, all the way through field service and maintenance.

Trust us for optimal system level connectivity solutions, not just "parts to spec".

### FULFILLING YOUR IN-FIELD DEMANDS THROUGH STRINGENT TESTING

We are constantly refining our testing approach to confirm that, as vital lessons are learned in the field, we bring that knowledge back to our global laboratories.

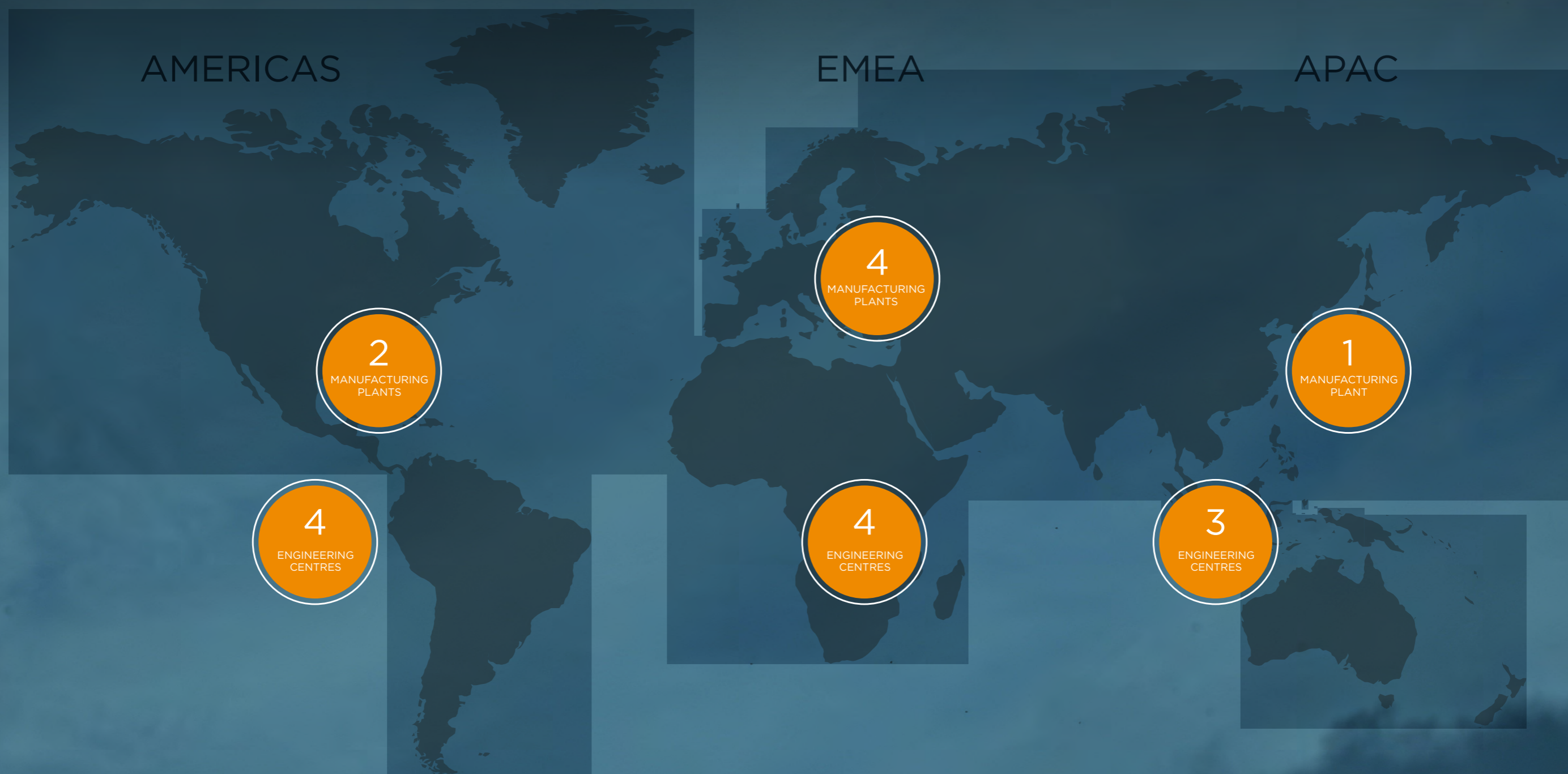
Typically, testing and validation is associated with the later stages of a product's development. But at TE, we strive to meet your connectivity needs earlier - so that the cost, size, and performance of the solution is ultimately optimized. Our highly competent environmental test, validation and analysis laboratories are a critical facet of each stage of a component's lifecycle.

Their role also doesn't just stop once a connectivity product is in production. If problems arise in the field, our environmental test and validation labs jump into action, working with internal and external engineers to analyse and diagnose problematic product and application issues. Most importantly, results are made available to design, manufacturing, and application engineers - helping to address design, production and end-application issues in a holistic manner.

# EMPOWERING YOU THROUGH LOCAL PRESENCE AND GLOBAL SERVICE

TE has a worldwide presence which enables you to realize your full potential in high-growth markets and emerging industries. We invest in modular production lines which enable immediate capacity increase, to sustain operations even during external disruptions.

This makes TE a **'one stop'** supplier that not only designs and manufactures these essential components, but is also capable of selling and distributing these products efficiently around the world. On top of this, our global network is on-hand to offer direct support whenever it is required - with our Field Service Engineers available on site or remotely to train and trouble shoot, as well as repair tooling and machines.



## ABOUT TE CONNECTIVITY

TE Connectivity is a global industrial technology leader creating a safer, sustainable, productive, and connected future. Our broad range of connectivity and sensor solutions, proven in the harshest environments, enable advancements in transportation, industrial applications, medical technology, energy, data communications and the home.

With approximately 85,000 employees, including more than 8,000 engineers, working alongside customers in approximately 140 countries, TE ensures that EVERY CONNECTION COUNTS. Learn more at [www.te.com](http://www.te.com) and on LinkedIn, Facebook, WeChat and Twitter.

## LET'S CONNECT

We make it easy to connect with our experts and are ready to provide all the support you need. For additional information or product assistance, please contact your field representative or our customer service department. Additional information is also available on the website [te.com/ict](http://te.com/ict).

## TECHNICAL SUPPORT

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