

DATA CONNECTIVITY SOLUTIONS

FOR INDUSTRIAL & COMMERCIAL TRANSPORTATION

TERMINALS AND CONNECTORS



MARKETS WE SERVE



ON-HIGHWAY

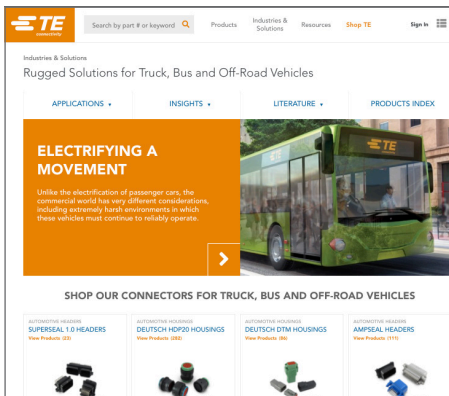


OFF-HIGHWAY

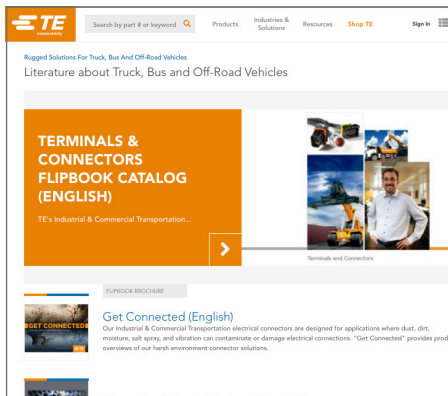


**RECREATIONAL
TRANSPORTATION**

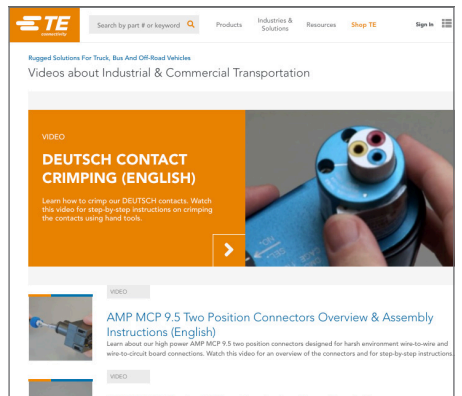
ONLINE RESOURCES



TE.COM/ICT



LITERATURE



VIDEOS



TE SOLUTION CENTER

You can rely on TE Connectivity's helpful Solution Center team to provide answers to your general and technical questions.

Connect with our Solution Center staff at:

te.com/support



WE GO TO EXTREMES TO MAKE SURE **EVERY CONNECTION COUNTS**

TE Connectivity (TE) Industrial & Commercial Transportation (ICT) is a reliable provider of solutions for harsh environmental conditions. With a focus on employee expertise and durable products, we deliver the solutions and support our customers can count on.

Years ago, tractors, construction equipment, trucks, and boats had simple electrical systems that might have included electrical starting and a basic lighting package. Today, ECUs, joysticks, fuel-efficient engines, LED lights, and CAN systems are standard equipment. The need to protect sensitive electrical systems from vibration, moisture, dust, dirt, salt, and airborne particles has never been greater. TE Industrial & Commercial Transportation is a leader in supporting today’s increasingly complex and sophisticated equipment and applications.

Our comprehensive line of products includes an unparalleled portfolio of rugged sensors, terminals, connectors, relays, and hybrid electric mobility solutions. These solutions are designed to withstand the harshest environmental conditions and to help vehicles operate safer, cleaner, and smarter.

Our solutions adapt to virtually any **harsh environment application**, including:



Motors and Gearboxes



ABS/EBS Brake Units



Telematics Units



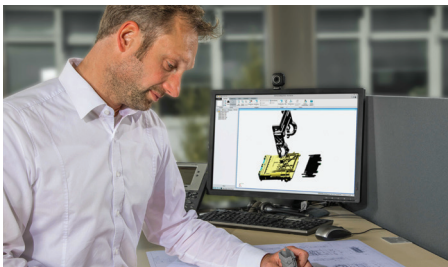
Sensors



Wire-To-Wire Coupling at the Chassis



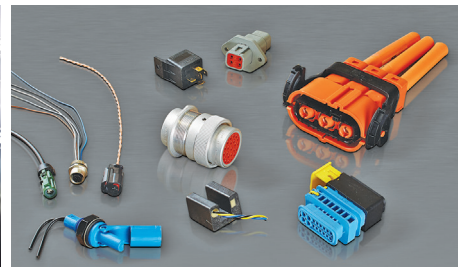
Infotainment Applications



**2,000+
EMPLOYEES**



**10,000
CUSTOMERS**



**20,000+
DIFFERENT PARTS**



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Introducing a Whole New World of Data Connectivity

TE Connectivity (TE) is dedicated to providing reliable data connectivity products that will support the next generation of connected vehicles. We offer an extensive portfolio of fast, reliable, and responsive harsh environment connectivity solutions.

The industrial and commercial transportation market is a diverse one, ranging from the commercial trucks and buses and last-mile delivery vans that populate urban and suburban landscapes to heavy equipment used in agriculture, construction and mining. Automation and Advanced Driver Assistance Systems (ADAS) are poised to unlock the potential of this industry by bringing greater reliability and accuracy to mission-critical work. Sophisticated core networks capture data from devices and systems and transmit it at high speeds with latency throughout the vehicle for processing in one or more on-board electronic control unit (ECUs). Cameras and Radar/LiDAR provide 360-degree situational awareness that enhances safety and productivity, while displays provide vehicle dashboards that help drivers optimize operations.

Market participants, including designers and original equipment manufacturers (OEMs), are encountering the following requirements as they seek to enable the next level of automation and safety in industrial and commercial vehicles:

- A need for greater bandwidth and faster speeds
- The ability to maintain signal integrity in harsh environments, channel lengths and temperatures specific to the commercial transportation and heavy equipment markets
- A desire to simplify adoption by providing flexible, serviceable and future-proofed product designs

To determine the best product for your application needs, the following table provides profile tradeoffs to aid with connector and cable assembly selection:

	Devices	Primary ICT Benefit	Example Protocols
enetSEAL+ Connector System	Backbone, Telemetry, Camera, Radar, Switches,	Leverage existing harness maker speed gains, passthrough, sealed header	100BASE-T1
Heavy Duty Sealed Connector Series with MATEnet Insert Connector System	Backbone, Telemetry, Camera, Radar, Switches, Displays	Familiar interface, Hybrid, passthroughs, sealed headers	100/1000BASE-T1, Type A
AMPSEAL 16 Connector System	Cameras, Sensors, Antennas, Telemetry	Familiar interface, Speed gains, passthroughs, sealed headers	GMSL II/III, FPD-LINK III/IV
DT Highspeed Connector System	Backbone, Telemetry, Camera, Radar, Switches, Displays	Lengths, future proof to multi-Gb, utilizing existing terminals and tools, serviceable	1000BASE-T1, Type A & B MULTIGIG
AMP MCP Hybrid Coax Connector System	Cameras	Firewall connection, passthroughs, hybrid coax/power, familiar terminal system	SerDes: GMSL2/3, FPDIV, APIX3, Analog (Antennas)
MATEnet Interconnection System	Backbone, Telemetry, Camera, Radar, Switches,	System Cost, speed gains vs CAN-Bus	100/1000BASE-T1 Type A
MATE-AX Interconnection System	Cameras, Sensors, Antennas, Telemetry	Miniaturization, future proof speed	GMSL II/III, FPD-LINK III/IV
High Speed Data (HSD) Connector System	Cameras, Controllers, Displays, Switches	Commoditized interface, large portfolio	LVDS protocols
FAKRA Connector System	Cameras, Sensors, Antennas, Telemetry	Commoditized interface, large portfolio, Cost	GMSL I/II, FPD-LINK, APIX

The Vital Link in your Data Chain

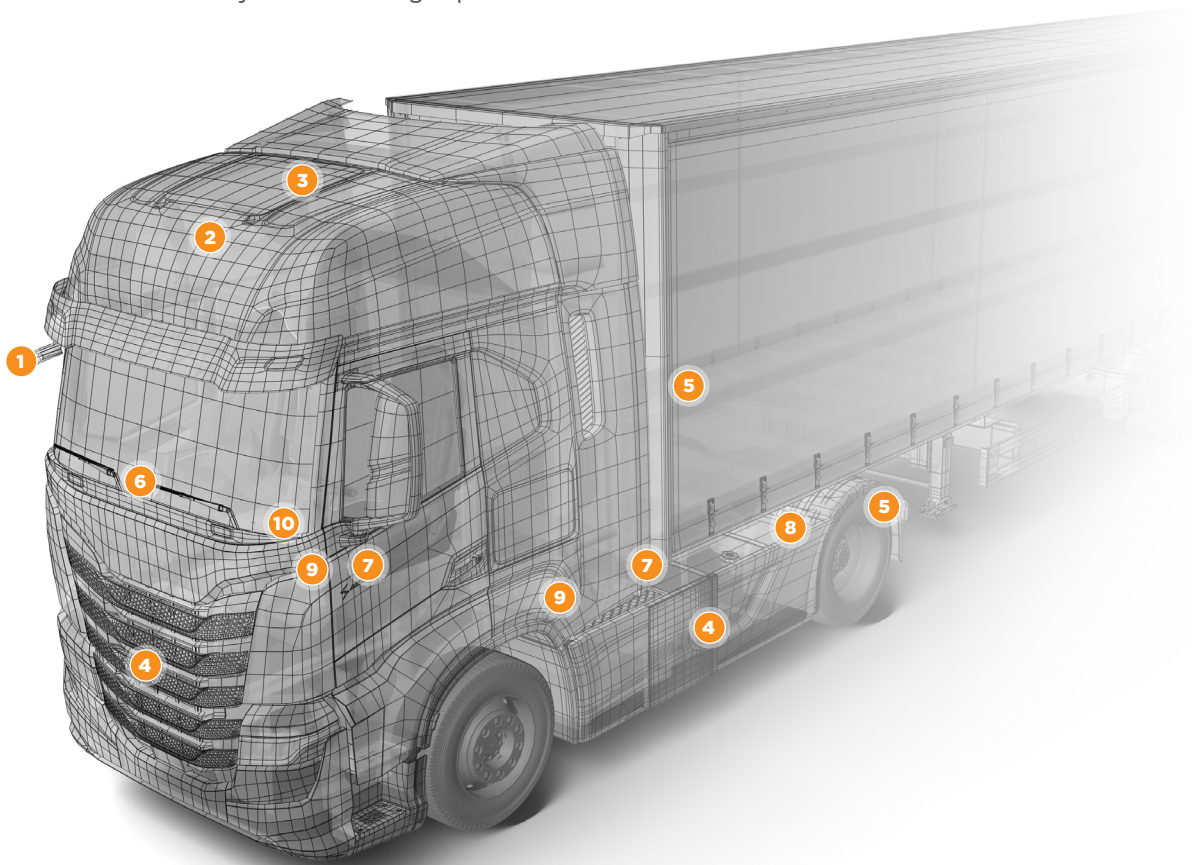
Our comprehensive portfolio of rugged sensors, terminals, connectors, relays, and hybrid and electric mobility solutions are designed to withstand dirt, moisture, salt, and vibration.

	Sealed and Robust Portfolio						Unsealed Portfolio				
	EEC	AMPSEAL 16	enetSEAL+	Heavy Duty Sealed Connector Series with MATEnet inserts	M12	DT Highspeed	FAKRA	HSD	MATE-AX	MATEnet	AMP MCP Hybrid Coax
CHASSIS											
Camera		X	X	X	X	X			X	X	
Telemetry Unit	X	X	X			X				X	
Antennas		X						X			
Radar/LiDAR		X	X	X	X	X		X	X		
GPS		X									
Displays		X	X		X	X					
Gateway/Switch			X	X	X	X				X	
Sealed Controller	X	X	X	X		X				X	
Network Backbone 100/1000 Base-T1				X	X	X				X	
Sensors	X			X						X	

IN CABIN											
ADAS Controller		X		X		X	X	X	X	X	
Network Backbone 10-T1 Base-T1			X	X		X		X		X	
Camera		X	X				X	X	X	X	X
Displays		X	X		X	X	X	X	X	X	
Telemetry Unit	X	X	X				X	X	X	X	
Dedicating short range Communication (V2X)		X							X		
Antennas		X					X		X		
Radar/LiDAR		X	X	X			X		X	X	
Gateway/Switch			X	X		X				X	
Multimedia/ Infotainment		X			X		X	X	X	X	
Instrument Panel Cluster							X	X	X	X	
Service Port/ Consumer Port								X		X	

Vehicle Type: Trucks

The use of intelligent transport systems in freight transport and logistics covers a broad range of applications. With our wide product range in the field of data connectivity we are the right partner.



APPLICATION AREAS



1

Camera



2

Telemetry Unit



3

Antenna



4

Radar/Lidar



5

Sensors



6

Display



7

Switch/Gateway



8

Sealed Controller



9

Network Backbone

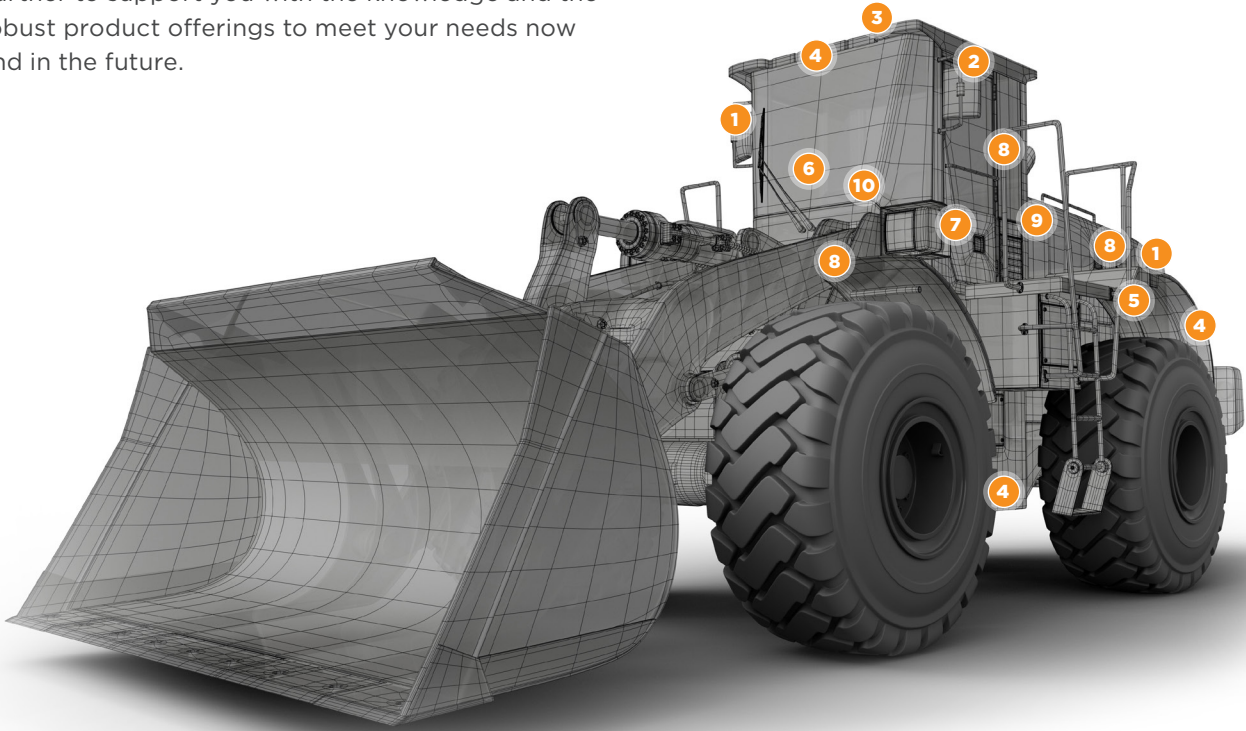


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Instrument Cluster

Vehicle Type: Construction

Construction equipment covers a wide range of use cases operating in extremely harsh conditions, all of which require increasing data functionality and speed. For these data connectivity challenges, TE is the best partner to support you with the knowledge and the robust product offerings to meet your needs now and in the future.



APPLICATION AREAS



1
Camera



2
Telemetry Unit



3
Antenna



4
Radar/Lidar



5
Sensors



6
Display



7
Switch/Gateway



8
Sealed Controller



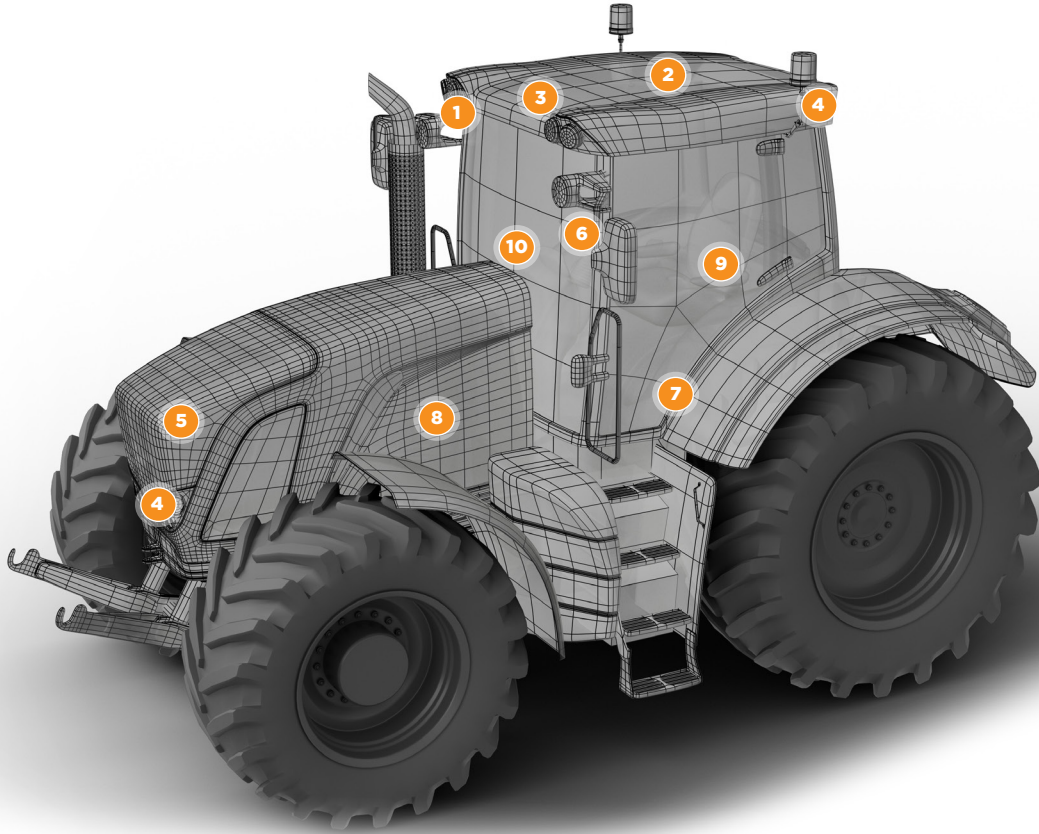
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Network Backbone



10
Instrument Cluster

Vehicle Type: Agricultural

Today, a tractor is more than just a motor-driven agricultural machine. With the help of robust, intelligent connectors from our product portfolio, it can become the hub of a farm's network and a farmer's workspace.



APPLICATION AREAS



1
Camera



2
Telemetry Unit



3
Antenna



4
Radar/Lidar



5
Sensors



6
Display



7
Switch/Gateway



8
Sealed Controller



9
Network Backbone



10
Instrument Cluster



Sealed and Robust Portfolio

Our specialized products all provide severe vibration and mechanical shock resistance, and some also allow for field maintenance in harsh environments such as those in which commercial vehicles operate. This includes situations involving dust, dirt, and moisture, and temperature ranges of -40°C to +125°C.

enetSEAL+ Ethernet Connectors	12
Heavy Duty Sealed Connector Series with MATEnet Inserts	15
DT Highspeed Connectors	19
AMPSEAL 16 Connector with MATE-AX Coaxial Terminals	22
EEC Header.....	24
M12.....	26

enetSEAL+ ETHERNET CONNECTORS

Our enetSEAL+ connectors support single pair 100 Mbps Ethernet with up to four in-line connections in a rugged interface to provide high speed data for applications like cameras, sensors, and displays within heavy-duty commercial and industrial vehicles. These connectors are compliant with IEEE 802.3bw 100BASE-T1 and BroadR-Reach communication protocols and utilize 20-22 AWG (0.50-0.35 mm²) Unshielded Twisted Pair (UTP) jacketed cable for a small, lightweight design.

enetSEAL+ connectors provide dependable performance in harsh environments with the use of industry proven MCON 1.2 clean body (CB) terminals for high vibration applications and long-term reliability. A built-in secondary locking feature provides added contact retention security, and the portfolio meets IP6K9K sealing performance (with backshell).

By using the MCON 1.2 CB terminal system and existing tooling, enetSEAL+ connectors are easy to assemble. Should harness repair be required in the field, terminals can be removed from the housing and connection can be repaired with simple hand tools, reducing service complexity and cost.



PRODUCT BENEFITS

- **Dependable performance** in harsh environments by meeting sealing and high vibration standards.
- **Convenient assembly and maintenance** with use of MCON 1.2 CB terminals and existing tooling, and a tool-free design for attaching sealed headers and pass-thru adapter to bulkhead.
- **Design flexibility** with a broad, integrated connector portfolio, cable sizes from 20-22 AWG.

APPLICATIONS



Camera ●●



Displays ●●



Telemetry Unit ●●



Gateway/Switch ●●



Radar/Lidar ●●



Sealed Controller ●



Network Backbone ●

● Available in Chassis ● Available in Cabin

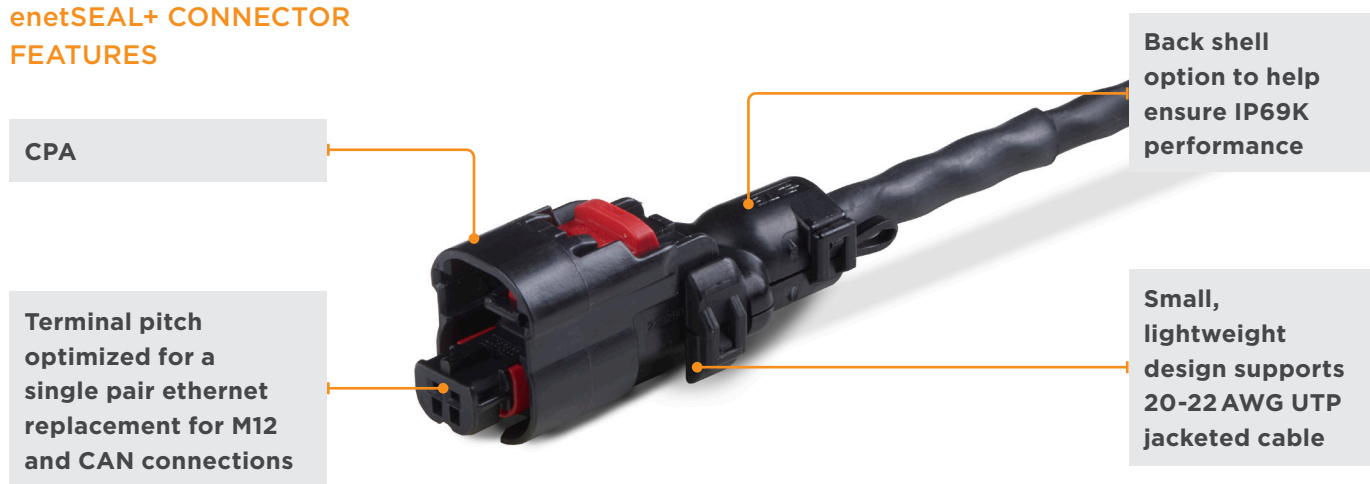
PRODUCTS

- enetSEAL+ 2P Plug
- enetSEAL+ 2P In-line
- enetSEAL+ 2P Pass-Thru Adapter
- 180° Headers
- 90° Headers

SPECIFICATIONS

Application Specification	114-151045
Product Specification	108-151045
Product Specification - Terminals	108-18782
Terminal Extraction Tool	8-1579008-4
Crimp Tooling	2-1579016-1 1579001-6 539635-1

enetSEAL+ CONNECTOR FEATURES



enetSEAL+ CONNECTOR HOUSINGS

Position	Description	Keying/Color	Plug (F) Housing	In-line (M) Housing	Panel Mount Pass-Thru Adapter Assembled Seal*
2	enetSEAL+ 100MB Cable Connector Housings	Code A	2292906-1	2292937-1	2325106-1
		Code B	2292906-2	2292937-2	Contact TE

Position	Description	Keying/Color	Header 180°				Header 90°
			Assembled Seal*	w/ Flange, Assembled Seal*	Dispensed Sealant	w/ Flange, Dispensed Sealant	
2	enetSEAL+ 100MB PCB Solder Headers	Code A	2325102-1	2325102-7	2325103-1	2325103-7	2339032-1
		Code B	Contact TE	Contact TE	Contact TE	Contact TE	Contact TE

* Use with mounting clip for locking seal to panel/cover

Data Connectivity Solutions

for Industrial & Commercial Transportation

Part Number	Description	Mates With
2373314-2	100Mb enetSEAL+, 8P, Multiport sealed panel mount (M) adapter Assy, Keys A x2, B x2, M5 screw attach	2292906-1
		2292906-2

enetSEAL+ CONNECTORS ACCESSORIES AND TERMINALS

Description	Keying / Color	TE PN
enetSEAL+ 100MB Mounting Clip 4.5 mm Panel	Brown	2325098-2
enetSEAL+ 100MB Mounting Clip 3.5 mm Panel	Gray	2325098-4
enetSEAL+ 100MB Mounting Clip 3.0 mm Panel	Yellow	2325098-6
enetSEAL+ Mounting Clip 2.0 mm Panel	Violet	2325098-7
enetSEAL+ Mounting Clip 1.0 mm Panel	Green	2325098-8
Wire Dress Backshell	Straight	2272168-1
2P Blind Plug Assembly	Code A	2345284-1
2P Blind Plug Assembly	Code B	2345284-2
2P Blind Cap Assembly	Universal	2376612-1

Description	Wire OD	Terminals	
		Female	Male
MCON Terminal 1.2 (Clean Body), Plating: Gold (Au)	20 AWG 0.5-0.75 mm ²	1670144-2	1718350-2
MCON 1.2 Terminal (Clean Body), Plating: Silver (Ag)		1670144-3	1718350-3
MCON 1.2 Terminal (Clean Body), Plating: Gold (Au)	22 AWG 0.25-0.35 mm ²	1534594-2	1718348-2
MCON 1.2 Terminal (Clean Body), Plating: Silver (Ag)		1534594-3	1718348-3

Additional terminal sizes and platings available

Heavy Duty Sealed Connector Series with MATEnet Inserts

Heavy Duty Sealed Connector Series with MATEnet inserts leverages the high performance of MATEnet terminals and the rugged reliability and scalability of Heavy Duty Sealed Connector Series housings to enable Ethernet connectivity up to 1Gbps on chassis applications in heavy-duty commercial vehicles.

These products are designed to be modular and highly adaptive to meet the specific needs of each customer. Unshielded twisted pair (UTP) cable and shielded twisted pair (STP) cable can be used within the same connection system. They support 100 Mbps through 1 Gbps speeds and are compliant with industry standard protocol 100BASE-T1 and 1000BASE-T1. This solution provides hybrid connections for Ethernet and power, expanding the usage possibilities. All the tried-and-true reliable features of our Heavy Duty Sealed Connector Series housings are taken advantage of here - a built-in secondary lock for contact retention, IP67 and IP6K9K (with backshell) dust and water protection, and vibration and mechanical shock resistance.











Finally, Heavy Duty Sealed Connector Series with MATEnet inserts are easy to assemble and install with low mating force, a reliable slide locking mechanism that comes in the pre-locked position, and mechanical polarization and several keying options.



PRODUCT BENEFITS

- **Highly adaptive design** to meet customers' specific needs, from cable type to wire size and data speed to power requirements
- **Rugged and reliable** with all the trusted features of Heavy Duty Sealed Connector Series housings
- **Easy assembly** with low mating force, pre-locked sliding lock, mechanical polarization and several keying options

APPLICATIONS

 Camera ●●	 Network Backbone ●●	 Radar/Lidar ●●
 Sensors ●	 Gateway/Switch ●●	 ADAS Controller ●
 Sealed Controller ●	 Multimedia/Infotainment ●	 Telematics Unit ●
 V2X ●		

● Available in Chassis ● Available in Cabin

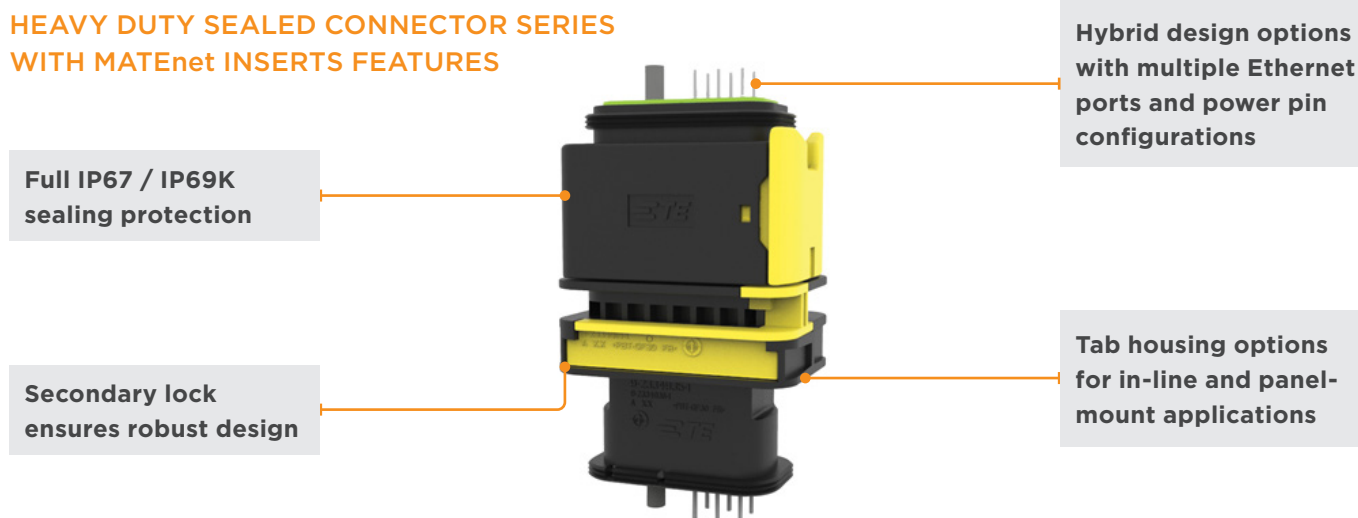
PRODUCTS

Receptacle Housing	1+2, 1+6, 1+12, 2+6, 3+0
Tab Housing	1+2, 1+6, 1+12, 2+6, 3+0
Tab Housing w/flange	1+2, 2+6
Header Assembly (vertical and right angle)	1+2, 1+6, 1+12, 2+6, 3+0

SPECIFICATIONS

Application Specification	114-94625
Product Specification	108-94725
Product Specification MATEnet Connector System	108-94568
Product Group Drawing Receptacle and Tab Housings	2362319
Product Group Drawing Headers	2385756

HEAVY DUTY SEALED CONNECTOR SERIES WITH MATEnet INSERTS FEATURES



GROUP C SIZE CONNECTORS

Position	Description	Keying / Color	Receptacle (Female) Housing	Tab (Male) Housing		Header Assembly	
				Without Flange	With Flange	Vertical Orientation (180°)	Right Angle Orientation (90°)
1+2	(1x) MATEnet terminal Ethernet connection	Code A / Black	9-2354261-1	9-2354242-1	9-2354248-1	9-2375248-1	9-2375246-1
		Code B / Gray	9-2354261-2	9-2354242-2	9-2354248-2	9-2375248-2	9-2375246-2

GROUP C SIZE ACCESSORIES

Description	Color	Part Number
Single Wire Seal, OD: 2.5 mm	Gray	2348771-1
Single Wire Seal, OD: 4 mm	Orange	2348771-2
Inserts Seal Clip, OD: 3.3 mm	Black	2348770-1
Inserts Seal Clip, OD: 4 mm	Black	2348770-2
Inserts Seal Clip, OD: 6 mm	Black	2348770-3



Description	Part Number
Backshell 90°	1670057-1
Backshell 180°	1670364-1
Protection Cap, Unsealed	2112301-1
Protection Cap, Sealed	2112293-1
Fixing Slides	1670720

GROUP D SIZE CONNECTORS

Position	Description	Keying/ Color	Receptacle (Female) Housing	Tab (Male) Housing	Header Assembly	
				Without Flange	Vertical Orientation (180°)	Right Angle Orientation (90°)
1+6	(1x) MATEnet terminal Ethernet connection (6x) 1.5 AMP MCP terminals	Code A / Black	9-2331355-1	9-2334935-1	9-2363903-1	9-2363899-1
		Code B / Gray	9-2331355-2	9-2334935-2	-	-
		Code C / Green	9-2331355-3	9-2334935-3	-	-
		Code D / Blue	9-2331355-4	9-2334935-4	-	-

GROUP D SIZE ACCESSORIES

Description	Color	Part Number
Single Wire Seal, OD: 2.5 mm	Green	9-2334941-1
Inserts Seal Clip, OD: 3.3 mm	Black	9-2334942-1
Inserts Seal Clip, OD: 4 mm	Blue	9-2334942-2



Description	Part Number
Backshell 90°	1563110-1
Backshell 180°	1563111-1
Protection Cap, Unsealed	2112302-1
Protection Cap, Sealed	2112295-1
Fixing Slides	1564562

GROUP E SIZE CONNECTORS

Position	Description	Keying/ Color	Receptacle (Female) Housing	Tab (Male) Housing	
				Without Flange	With Flange
1+12	(1x) MATEnet terminal Ethernet connection (12x) 1.5 AMP MCP terminals	Code A / Black	9-2348795-1	9-2348792-1	Contact TE
		Code B / Gray	9-2348795-2	9-2348792-2	
2+6	(2x) MATEnet terminal Ethernet connection (6x) 1.5 AMP MCP terminals	Code A / Black	9-2348786-1	9-2348782-1	9-2348789-1
		Code B / Gray	9-2348786-2	9-2348782-2	9-2348789-2
3+0	(3x) MATEnet terminal Ethernet connection	Code A / Black	9-2348776-1	9-2348772-1	Contact TE
		Code B / Gray	9-2348776-2	9-2348772-2	

Group E size header assemblies are in development. Contact TE for more information.

GROUP E SIZE ACCESSORIES

Description	Color	Part Number
Single Wire Seal, OD: 2.5 mm	Gray	2348771-1
Single Wire Seal, OD: 4 mm	Orange	2348771-2
Inserts Seal Clip, OD: 3.3 mm	Black	2348770-1
Inserts Seal Clip, OD: 4 mm	Black	2348770-2
Inserts Seal Clip, OD: 6 mm	Black	2348770-3



Description	Part Number
Backshell 90°	1670865-1
Backshell 180°	1370866-1
Protection Cap, Unsealed	2112303-1
Protection Cap, Sealed	2112297-1
Fixing Slides	1564411

DT Highspeed Connectors

DT highspeed sealed connectors enable highspeed Ethernet channels from 100 Mbps to 1Gbps (IEEE 802.3bp multi-Gb protocol) to meet current and future data connectivity demands in commercial and industrial vehicles. These products are the first of their kind to reach channel lengths up to 40 meters – the standard length needed in the commercial and industrial vehicle industry.

Comparative products can only reach lengths up to the standard 15 meters found in the automotive industry. They also meet the unique temperature and reliability requirements of vehicles and heavy equipment used in the industry’s harshest environments. DT highspeed connectors can be used in applications that require additional cameras, sensors such as LiDAR and RADAR, enhanced network architectures, increased information and displays, and large-bandwidth backbones.









These connectors utilize our time-tested DEUTSCH DT/DTM interface and DEUTSCH size 20 common contacts so you can feel confident in their dependability and performance. Existing DEUTSCH tooling may also be used to crimp wires. The simplified termination design allows for harness makers to terminate to cable without overly complex process parameters or costly equipment, so you can tap into your existing harnessing supply infrastructure.



PRODUCT BENEFITS

- Support channel lengths up to 40 meters
- Interoperable with other TE Ethernet connectors enabling broad, off-the-shelf sealed and unsealed options
- Enable use of existing tooling and harness suppliers
- Easy assembly, service, and repair
- Excellent signal integrity in the harshest environments

APPLICATIONS

 Camera ●	 Telematics Unit ●	 Radar/Lidar ●
 Displays ●●	 Gateway/Switch ●●	 Sealed Controller ●
 Network Backbone ●●	 ADAS Controller ●	

● Available in Chassis ● Available in Cabin

Data Connectivity Solutions

for Industrial & Commercial Transportation

PRODUCTS

Pin & Socket Housing Assemblies (4 keying options)

Pin & Socket Connector Kits

Pin & Socket Sub-Assemblies

Socket Cover Assembly w/CPA

Pin Cover Assembly

PCB Header Assemblies (4 keying options)

180° Header Sub-Assembly

SPECIFICATIONS

Product Specification 108-94825

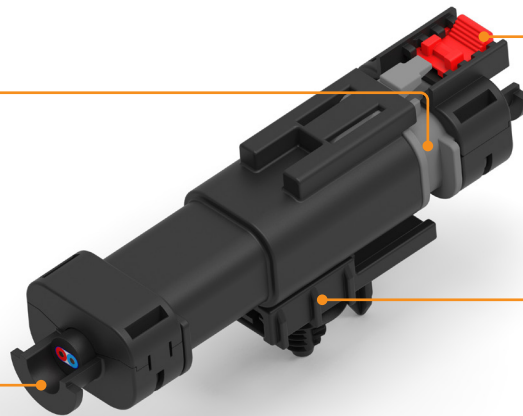
Application Specification 114-94706

Terminal Hand Crimp Tool HDT-48-00

DT HIGHSPEED CONNECTOR FEATURES

Four color-coded key options available for all connector housings to ease assembly process.

Cable tie at exit designed into shell for improved mechanical robustness.



CPA helps prevent accidental unmating and provides visual assurance of proper connector installation and locking.

Optional mounting clip enables a secure inline connection for improved vibration performance.

DT HIGHSPEED CONNECTORS

Key	Color	Sockets		Pins		Headers		
		Housing Assembly	Connector Kit ²	Housing Assembly	Connector Kit ²	Bulkhead Header Assembly	180° PCB Header Assembly	90° PCB Header Assembly
A	Black	9-2367337-1	9-2386764-1	9-2367341-1	9-2386764-1	9-2383999-1	9-2367359-1	2386211-1
B	Gray	9-2367337-2 ¹	-	9-2367341-2 ¹	-	9-2367359-2 ¹	-	-
C	Green	9-2367337-3 ¹	-	9-2367341-3 ¹	-	9-2367359-3 ¹	-	2386211-3
D	Blue	9-2367337-4 ¹	-	9-2367341-4 ¹	-	9-2367359-4 ¹	-	-

Sub-Assemblies			Cover Assemblies	
Socket	Pin	Header (180°, Shielded Pin)	Socket (w/CPA) 0.50 mm ² STP cable O.D.	Socket (w/CPA) 0.35 mm ² STP cable O.D.
9-2370714-1	9-2370710-1	9-2370706-1	9-2367345-1	9-2367345-2

¹Contact TE for more information and availability.

²Kits contain all connector components and terminals to assemble one full connector - cable not included.

SEAL/FERRULE HARDWARE

Description	Part Number	Use With	Mates To
Single Wire Seal, 20 AWG [0.5 mm ²]	9-2367346-1	9-2367345-1 9-2367344-1	Approved STP 0.50 mm ² /20 AWG
Single Wire Seal, 22 AWG [0.35 mm ²]	9-2367346-2	9-2367345-2 9-2367344-3	Approved STP 0.35 mm ² /22 AWG
Crimp Ferrule, 20 AWG [0.5 mm ²]	9-2370624-1	9-2370714-1	Approved STP 0.50 mm ² /20 AWG
Crimp Ferrule, 22 AWG [0.35 mm ²]	9-2370624-2	9-2370710-1	Approved STP 0.35 mm ² /22 AWG
DEUTSCH Socket Size 20 (AWG) Solid Terminal, AU Plating	0462-201-2031	9-2370714-1	0460-202-2031
DEUTSCH Pin Size 20 (AWG) Solid Terminal, AU Plating	0460-202-2031	9-2370710-1	0462-201-2031
DT Mounting Clip, BLK, Fir Tree Stud Mount	1011-310-0205	9-2367341-X	-
Blind Plug, Key - Universal	2384003-1	-	9-2367341-X 9-2367359-X

TOOLING

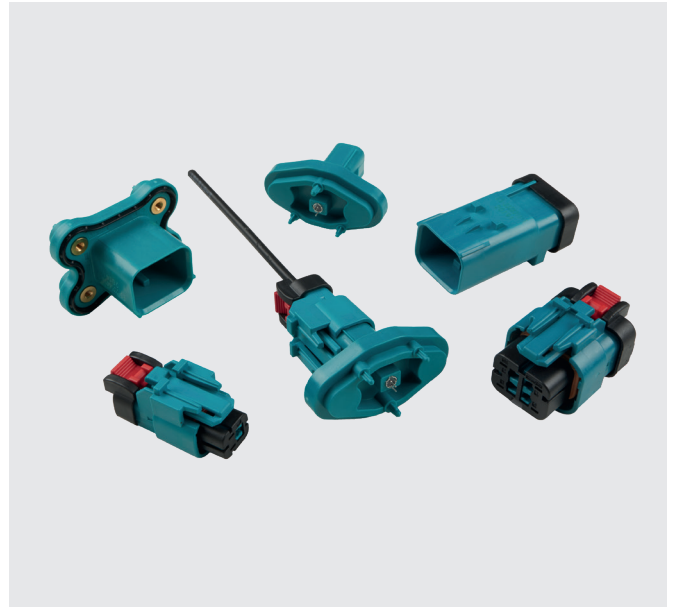
	Handtools			Benchtop	
	Handtool & Die Set	Handtool Frame only	Die Set only	Benchtop Press	Benchtop Die Set
Benchtop Press	2399600-1	2362810-1	2399600-2	2348822-2	2380176-1
Ferrule 0.35 mm ² STP	Handtool & Die Set	Handtool Frame only	Die Set only	Benchtop Press	Benchtop Die Set
	TBA	2362810-1	TBA	2348822-2	TBA
Size 20 DEUTSCH Terminal	Handtool	Benchtop Die Set	Benchtop Die Set Locator	Benchtop Press	-
	HDT-48-00	414DA-20N.038	400-4301-20S	HDP-400	-

AMPSEAL 16 Connector with MATE-AX Coaxial Terminals

AMPSEAL 16 connectors with MATE-AX miniaturized FAKRA coaxial system delivers analog signal up to 6 GHz and digital data transmission to reliably connect antennas, cameras, sensors, and displays within heavy-duty commercial and industrial vehicles. Their easy-to-use, flexible design utilizes widely available automotive-standard RTK031 and RG174 coaxial cable types to enable easy integration into existing coaxial architecture. They support a wide range of communication protocols, including FPD-LINK-II/III/IV, GMSL 2/3, Apix2/3, GNSS, GPS, 4G, and LTE.

AMPSEAL 16 connectors with coaxial terminals offer a higher packaging density than similar products with a robust sealed housing design. The integration of a family seal into the housing design not only eases assembly but can also reduce manufacturing and service costs by eliminating expensive heat shrink tubing and time-consuming application.











These products meet the vibration, mechanical shock and temperature requirements of rugged vehicles by utilizing the proven design of our AMPSEAL 16 housings along with the superior signal performance of our MATE-AX miniature coaxial terminals.



PRODUCT BENEFITS

- Designed specifically for coaxial connection needs in heavy-duty off-road and on-highway applications
- Supports GMSL2 performance requirements up to 6GHz with MATE-AX miniaturized coax terminals and RTK031 or RG174 cable
- Full IP Protection IP67 / IP69K
- Sealed coaxial interface using historically proven AMPSEAL 16 connector system

APPLICATIONS

 Camera ●●	 Displays ●●	 Telemetry Unit ●●
 Sealed Controller ●	 Antenna ●●	 ADAS Controller ●
 Radar/Lidar ●●	 V2X ●	 GPS ●
 Multimedia/Infotainment ●●		

● Available in Chassis ● Available in Cabin

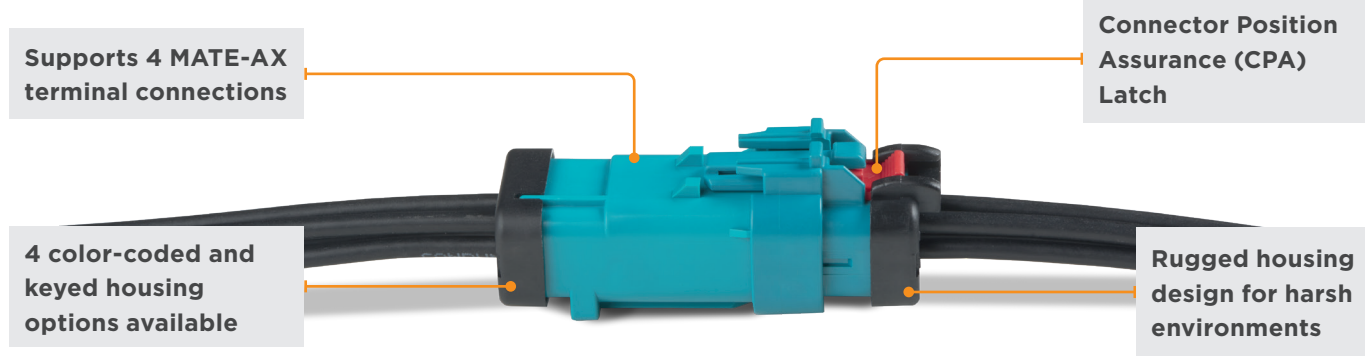
PRODUCTS

4P Female Plug Housing
4P Male In-Line Housing
4P Male Bulkhead Housing
4P 180° Header
1P Female Plug Housing
1P 180° Header

SPECIFICATIONS

Application Specification	114-94667
Product Specification	108-94799
Product Specification - Terminals	108-94515
Terminal Extraction Tool	776441-1

AMPSEAL 16 CONNECTOR FEATURES



AMPSEAL 16 CONNECTOR HOUSINGS

Type		Housings		Bulkhead (Male)	180° PCB Mount Headers	180° PCB Mount Headers Dispensed Sealant	90° PCB Mount Headers Dispensed Sealant
Position	Keying	Plug Assembly (Female)	In-Line Assembly (Male)				
1	A	2355843-1	2374559-1	Contact TE	2355844-1	-	-
4	A	2338212-1	2338211-1	2339729-1	2356408-1	2439715-2	2394674-1

AMPSEAL 16 ACCESSORIES & TERMINALS

Description		Part Number	Use With
1p PCB Terminal 180° Assembly		2356413-2	2379753-1 (PCB/Interface Cover)
Sealing Plug (Yellow)		776363-1	2338212-X, 2338211-X, 2339729-X
4P Seal Blind Cap Housing		2040594-3	2338212-1
Backshell Kits	4p Plug (Female)	2292799-X	2338212-X
	4p In-line (Male)	2292862-X	2338211-X, 2339729-X
Mounting Clips (Straight)	20.5 mm	1924487-1	2338211-1, 2374559-1
	20.5 mm, anti-rotation post	1924487-2	
	11 mm	1924487-3	

EEC Header

Customers need an off-the-shelf enclosure which can be used to develop custom electronics and controllers. Existing solutions offer robust signal and power interfaces, but there is limited availability of offerings with coaxial interfaces. Adding a coax interface, likely would require precision milling, adding cost and processing challenges.

TE Connectivity has developed a variant of its popular EEC enclosure to include TNC (Threaded Neill Concelman) and SMA (Sub-Miniature-A) interfaces. These interfaces are on a cable which can conveniently be connected to any part of the PCB to maximize PCB design layout and tracing of the coaxial signal.



TNC/SMA

TE's vast RF coax portfolio has supported many applications across multiple industries for many years. TE's RF connectors and cable assemblies provide you with solutions for your RF connection requirements for legacy coax solutions which have been used in a number of commercial vehicle applications for many years. While this section only highlights few TNC and SMA parts, TE's portfolio is much broader and can support your specific application needs.

PRODUCT BENEFITS

- TE EEC solution reduces design time and investment for new projects by offering a fully sealed signal and power connector interface with a DEUTSCH sealed enclosure
- Enables custom telemetry functionality with sealed TNC/SMA coaxial interface option
- 12 position DEUTSCH PCB mount interface with four keying options available completes the sealed header interface

APPLICATIONS



Telemetry Unit ●



Sensors ●



Sealed Controller ●

● Available in Chassis ● Available in Cabin

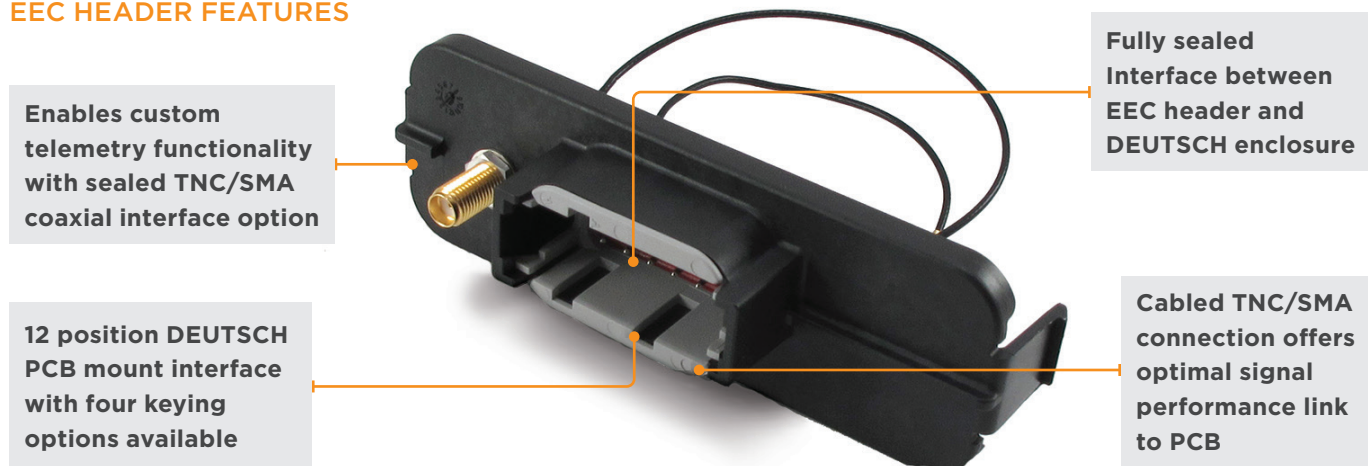
PRODUCTS

TNC / DTM EEC Header	Part Number: 2333580-X DEUTSCH Header Alias: DTM13-12X-R019
SMA / DTM EEC Header	Part Number: 2333581-X DEUTSCH Header Alias: DTM13-12X-R020

SPECIFICATIONS

Application Specification	108-151090
Coax Cable Specifications	C2016456
Box Drawing & Recommended PCB Layout:	EEC-325X4A-EEC-325X4B

EEC HEADER FEATURES



TE PN	DEUTSCH Reference PN	Description	Mates w/ DEUTSCH Enclosures
2333580-X	DTM13-12PX-R019	EEC Header, with TNC coax interface, Key X	EEC-325X4A, EEC-325X4A-E016
2333581-X	DTM13-12PX-R020	EEC Header, with SMA coax interface, Key X	
EEC-325X4A		Enclosure with vent hole, black	
EEC-325X4A-E016		Enclosure with vent hole, clear	

* xxx-1 Key A / xxx-2 Key B / xxx-3 Key C /xxx-4 Key D - further codings on request

TNC AND SMA AVAILABLE PRODUCTS

- TNC and SMA interfaces
- Plug and panel bulkheads/ passthroughs and board PCB
- Sealed and unsealed
- Crimp style contacts

PRODUCT BENEFITS

- Wide portfolio
- Standardized interfaces
- Historical reliability
- 50 ohm and 75 ohm versions
- TNC: Up to 7 GHz operating frequencies
- SMA: Up to 12.4 GHz operating frequencies
- Sealing options available

NOTE: Contact your TE representative for more information on the TNC and SMA products.

M12

The Commercial Vehicle and Industrial Equipment market is undergoing a transformation requiring more devices, data, information to be passed through networks and to users. These applications are enabling improvements in safety, productivity, vehicle networks, ADAS and infotainment.

These new requirements are bringing a new challenge to design engineers – who need to ensure that vehicles perform and stand the test of time in the harshest applications, and will future proof vehicle networks for the applications which we don't yet see today, but know are coming.

M12 Products provide robust connections for commonly used data protocols including several ethernet (100/1000/10G Base-Tx) and several CAN related protocols (NEMA 2K). It has historically been used in marine, agriculture and construction applications. TE's M12 products provide an excellent way to connect to those existing device and sensor interfaces. TE offers industrial ethernet patch cables with over molded M12 connectors. Customized cable assemblies offer a solution for your specific needs in different lengths, temperatures or flexibility.



PRODUCT BENEFITS

- M12 Products provide robust connections for commonly used data protocols
- Connect existing device and sensor interfaces
- Customized cable assemblies offer a solution for your specific needs

APPLICATIONS



Camera ●



Gateway/Switch ●



Radar/Lidar ●



Network Backbone ●



Displays ●

● Available in Chassis

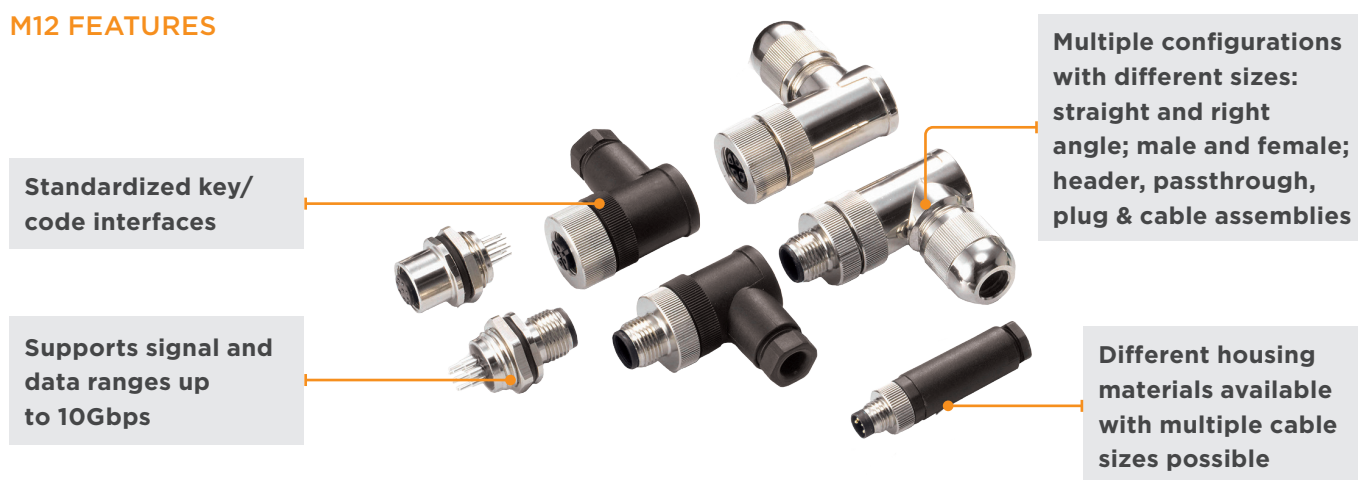
PRODUCTS

A Key	For sensors and CAN-Bus applications
D Key	For 2 twisted pair Ethernet
X Key	For 4 twisted pair Ethernet

SPECIFICATIONS

Application Specifications Cable Assemblies and Components	114-32127
	114-137008
	114-137144
Product Specifications	108-3631
	108-19483
	108-106140
	108-137008
Brochure	1-1773701-8

M12 FEATURES



PLUGS AND HEADERS

Code	Description	Type	New PN	Poles
A	M12, male, A code, rear mount, PCB, R/A, unshielded	Header	T4144015051-000	5
	M12, male, A code, rear mount, PCB, R/A, shielded	Header	T4144035051-000	5
	M12, male, A code, rear mount, PCB, 180, shielded	Header	T4130012051-000	5
	M12, female, A code, rear mount, PCB, R/A, unshielded	Header	T4145015051-001	5
	M12, female, A code, rear mount, PCB, R/A, shielded	Header	T4145035051-001	5
	M12, female, A code, rear mount, PCB, 180, shielded	Header	T4131012051-000	5
	Screw, A code plug, unshielded, PG7, F	Plug, screw terminated	T4110001051-000	5
	Screw, A code plug, unshielded, PG9, F	Plug, screw terminated	T4110002051-000	5
	Screw, A code plug, shielded, PG7, F	Plug, screw terminated	T4110011051-000	5
	Screw, A code plug, shielded, PG9, F	Plug, screw terminated	T4110012051-000	5
	Screw, A code plug, unshielded, PG7, M	Plug, screw terminated	T4111001051-000	5
	Screw, A code plug, unshielded, PG9, M	Plug, screw terminated	T4111002051-000	5
	Screw, A code plug, shielded, PG7, M	Plug, screw terminated	T4111011051-000	5
	Screw, A code plug, shielded, PG9, M	Plug, screw terminated	T4111012051-000	5

PLUGS AND HEADERS (continued)

Code	Description	Type	New PN	Poles
D	M12, male, D code, rear mount, PCB, R/A, unshielded	Header	T4144515041-000	4
	M12, male, D code, rear mount, PCB, R/A, shielded	Header	T4144535041-000	4
	M12, male, D code, rear mount, PCB, 180, shielded	Header	T4140512041-000	4
	M12, female, D code, rear mount, PCB, R/A, unshielded	Header	T4145515041-001	4
	M12, female, D code, rear mount, PCB, R/A, shielded	Header	T4145535041-001	4
	M12, female, D code, rear mount, PCB, 180, shielded	Header	T4141512041-000	4
	Crimp, D code plug, M	Plug, crimp terminated	1-2823445-1	4
	Screw, D code plug, unshielded, PG7, F	Plug, screw terminated	T4110501041-000	4
	Screw, D code plug, unshielded, PG9, F	Plug, screw terminated	T4110502041-000	4
	Screw, D code plug, shielded, PG7, F	Plug, screw terminated	T4110511041-000	4
	Screw, D code plug, shielded, PG9, F	Plug, screw terminated	T4110512041-000	4
	Screw, D code plug, unshielded, PG7, M	Plug, screw terminated	T4111501041-000	4
	Screw, D code plug, unshielded, PG9, M	Plug, screw terminated	T4111502041-000	4
	Screw, D code plug, shielded, PG7, M	Plug, screw terminated	T4111511041-000	4
Screw, D code plug, shielded, PG9, M	Plug, screw terminated	T4111512041-000	4	
X	Crimp, X code plug, 8.1 mm, 8.4 mm, 8.8 mm OD, M	Plug, Crimp terminated	1-2315714-x	8
	M12 X-CODE CAT6A	Plug, IDC terminated	2327989-1	8

CABLE ASSEMBLIES

Code	Description	Length (Part Suffix)	New PN	Poles
A	M12 FS 5P PUR Cable **M	-001: 0.5 m	T4151320005	5
	M12 FS 5P PUR Cable **M SH	-002: 1.0 m	T4161320005	5
	M12 MS 5P PUR Cable **M	-003: 1.5 m	T4151120005	5
	M12 MS 5P PUR Cable **M SH	-004: 3.0 m	T4161120005	5
	M12 FR 5P PUR Cable **M	-005: 5.0 m	T4151420005	5
	M12 FR 5P PUR Cable **M SH	-006: 7.0 m	T4161420005	5
D	M12D4-MS-PUR TYPE C GREEN-**M	-007: 10.0 m	TAD14145101	4
	M12D4-MR-PUR TYPE C GREEN- **M	-	TAD14245101	4
X	X code, M12, 180, M/M, **m	-	X-2317142-X	8
	X code,	-	2241021-X	8



Unsealed Portfolio

TE Connectivity’s portfolio of unsealed connectors provides connectivity solutions for automotive infotainment modules, cameras, consumer connectors and display units according to your needs. The connector product portfolio can be used in combination with various protocols in sealed applications.

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MATenet Interconnection System	32
MATE-AX Interconnection System	34
High Speed Data (HSD) Communication Connectors	36
FAKRA Connector System.....	38

AMP MCP Hybrid Coax Connectors

AMP MCP hybrid coax connectors utilize existing unsealed AMP MCP connectors to provide a coaxial data connection up to 9 GHz and power connection to enable the implementation of high-resolution cameras within trucks and buses. These connectors are designed for bulkhead passthrough applications, specifically for connections that must pass through the firewall within a truck or bus to connect front and rear cameras on the vehicle.

These products utilize our widely available and industry proven MCON 1.2 clean body (CB) terminals (power) and MATE-AX terminals (coax) for reliable quality and performance and self-termination capabilities for customers. The connector design is easy to assemble in existing firewall frames, providing potential cost and time savings for customers making upgrades to their vehicle designs. A hybrid design with both coaxial data and power in one connection offers increased design flexibility and can help save space.



PRODUCT BENEFITS

- Use for high resolution camera connections now and in the future
- Easy to integrate into existing firewall frames
- Reliable performance and easy termination with the use of existing MCON 1.2 CB and MATE-AX terminals
- Flexibility with hybrid design that can also help save space

APPLICATIONS



Camera •

• Available in Cabin

Data Connectivity Solutions

for Industrial & Commercial Transportation

PRODUCTS

Plug housing assemblies	11 position (2 MATE-AX + 9 MCON 1.2 CB)
Receptacle housing assemblies	11 position (2 MATE-AX + 9 MCON 1.2 CB)

SPECIFICATIONS

Application Specifications	114-160052
Product Specification	108-160086
MCON 1.2 Terminal Hand Crimp Tool	Depends on wire size. Contact TE

CONNECTORS

Key	Color	Tab Housing Assembly	Receptacle Housing Assembly
A	Black	2377861-1	2377860-1
B	Gray	2377861-2	2377860-2
C	Green	2377861-3	2377860-3
D	Blue	2377861-4	2377860-4

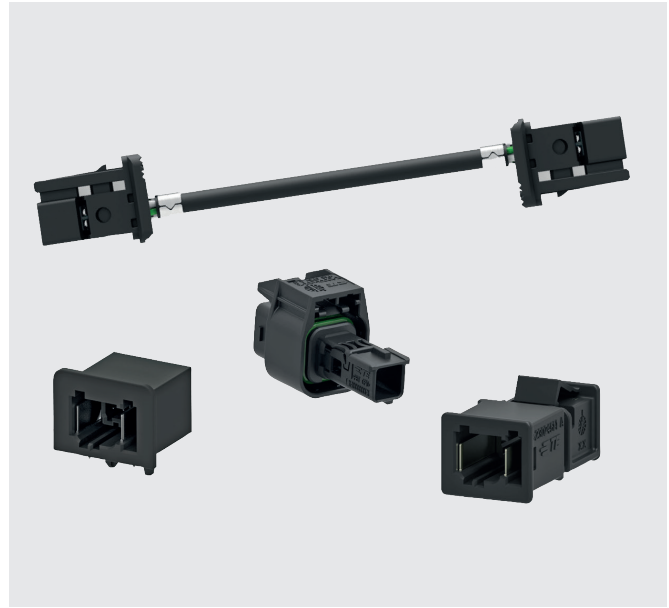
Description	Part Number	Mates To
11POS, HYBRID, TAB HSG ASSY, UNSLD	2377861-X	2377860-X
11POS, HYBRID, REC HSG ASSY, UNSLD	2377860-X	2377861-X

* Additional hybrid configuration can be developed upon request. Contact TE to learn more.

MATEnet Interconnection System

TE Connectivity's MATEnet modular and scalable connectors are designed for the harsh automotive environment and can transmit up to 1 Gbps according to IEEE 100BASE-T1 and 1000BASE-T1 standards.













TE's MATEnet interconnection system contributes to modern E/E architectures and answers today's and tomorrow's requirements of vehicle connectivity. MATEnet interconnection system was specifically developed for IEEE Automotive Ethernet networks and set a standard for unshielded cabling. It relies on automotive-grade, miniaturized, robust and proven interconnection technology and has successfully passed severe testing and validation.



PRODUCT BENEFITS

- Can transmit up to 1 Gbps according to Automotive Ethernet standards IEEE 100BASE-T1 and 1000BASE-T1
- Modular and scalable connectors for easy integration into existing and new connectivity interfaces
- Compatible with Unshielded Twisted Pair (UTP) and Shielded Twisted Pair (STP) cable
- Contributes to modern E/E architectures and answers today's and tomorrow's requirements of vehicle connectivity

APPLICATIONS

 Camera ●●	 Sensors ●	 Telemetry Unit ●●
 ADAS Controller ●	 Radar/Lidar ●●	 Displays ●
 Gateway/Switch ●●	 Multimedia/Infotainment ●	 Sealed Controller ●
 Instrument Cluster ●	 Network Backbone ●●	 Service Port ●

● Available in Chassis ● Available in Cabin

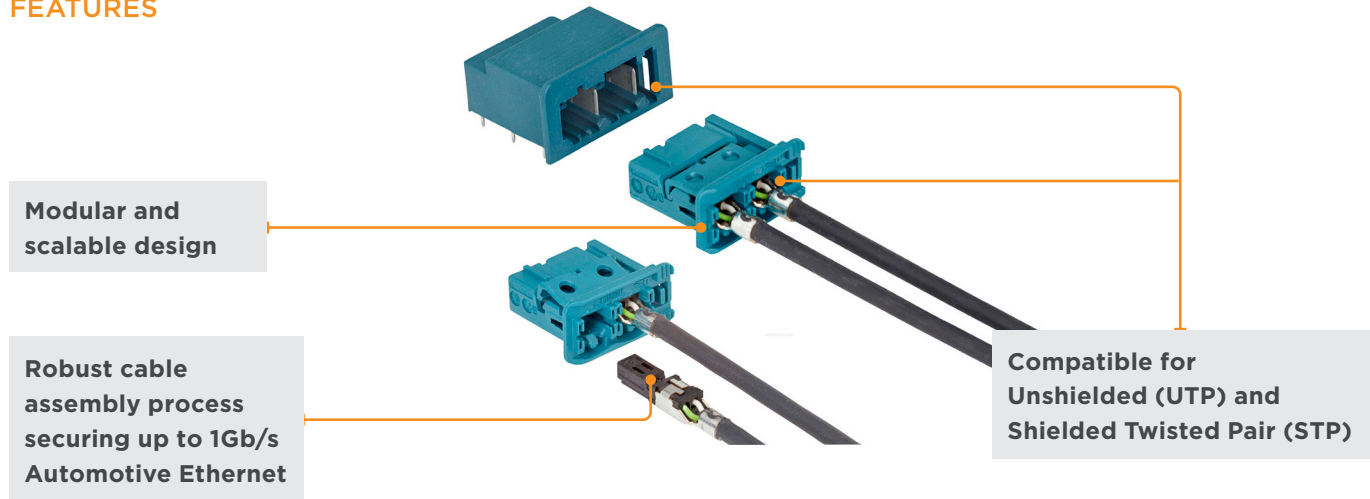
PRODUCTS

See product table below

SPECIFICATIONS

Application Specifications Cable Assemblies and Components	114-94431
Application Specification Header	114-94448
Product Specification	108-94568
Brochure	1-1773941-1

MATenet INTERCONNECTION SYSTEM FEATURES



Part Number	Description	Sample available
0-2304372-1/-2/-3*	1 port Header	Yes
0-2302461-1/-2/-3*	1 port Inline Coupler	Yes
0-2305987-1/-2/-3*	2 port Header	Yes
0-2305390-1/-2/-3*	5 port Header	Yes
0-1802162-1/-2/-3*	1 port sealed Header	Yes
0-2302454-1/-2/-3*	1 port Frame UTP	Yes
0-2302510-1/-2/-3*	1 port Frame STP	Yes
0-2305974-1/-2/-3*	2 port Frame UTP	Yes
0-2307961-1/-2/-3*	2 port Frame STP	Yes
0-2302455-1/-2/-3*	5 port Frame UTP	Yes
0-2302515-1/-2/-3*	5 port Frame STP	Yes
2317303-1	6 port Frame Dual Row UTP	Yes
0-1802105-1/-2/-3*	1 port sealed Frame UTP	Yes
0-1802113-1/-2/-3*	1 port sealed Frame STP	Yes

* xxx-1 Code A / xxx-2 Code B / xxx-3 Code C - further codings on request

For a full list of part numbers, view the [MATenet Modular and Scalable Connectors brochure](#).

MATE-AX Interconnection System

TE Connectivity’s MATE-AX miniaturized terminals, housings and headers are designed for the harsh automotive environment and can transmit easily 9 GHz and even more (20 GHz) with optimized design. The MATE-AX interconnection system contributes to modern E/E architectures and answers today’s and tomorrow’s requirements of vehicle connectivity. MATE-AX interconnection system was specifically developed for the next generation of coax applications and set a standard for future coax system. The design is based on TE’s automotive-grade experience on miniaturized, robustness interconnection technology.



PRODUCT BENEFITS

- Higher frequency rate - applicable for 9 GHz and more with optimized designs
- Flexible integration into existing coax-architecture by supporting commercial vehicle graded cables similar to RTK-031 and RG174
- Huge space saving due to miniaturized design
- Cost efficient - design and process perfectly aligned for commercial vehicle coaxial needs

APPLICATIONS

 Camera ●●	 Telemetry Unit ●	 Antenna ●●
 V2X ●	 Radar/Lidar ●●	 Multimedia/Infotainment ●
 ADAS Controller ●	 Instrument Cluster ●	 Displays ●

● Available in Chassis ● Available in Cabin

PRODUCTS

See product table below

SPECIFICATIONS

Application Specifications	114-94443
	114-94571
	114-94572
	114-94443
	114-94468
	114-94413
Product Specifications	108-94544
	108-94515
	108-94709
Brochure	1-1773981-7

MATE-AX INTERCONNECTION SYSTEM FEATURES



Part Number	Description	Sample available
0- / 1-2310558-1/-2/-9*	1 pos. Header	Yes
0- / 1-2306368-1/-2/-9*	2 pos. Header	Yes
0- / 1-2304168-1/-2/-9*	4 pos. Header	Yes
0- / 1-2310137-1/-2/-9*	1 pos. Plug	Yes
0-2306868-1/-2/-9*	2 pos. Plug	Yes
0-2298721-1/-2/-9*	4 pos. Plug	Yes
0- / 1-2310138-1/-2/-9*	1 pos. Jack	Yes
0-2306498-1/-2/-9*	2 pos. Jack	Yes
0-2298724-1/-2/-9*	4 pos. Jack	Yes
0-2354440-1/-2/-9*	4 pos. Sealed Jack	No
0-2354439-1/-2/-9*	4 pos. Sealed Plug	No

* xxx-1 Code A / xxx-2 Code B / xxx-9 Code Z. Refer C-Drawings for further codings
 * Housing and Headers: Serie: 0- or 1- / Pilot: 6- / 7- / 8- / 9-
 * Headers: Latch position available in 12h and 6h
 * CPA and clip slot variant on request

For a full list of part numbers, view the [MATE-AX Miniaturized Coaxial Connector System brochure](#).

High Speed Data Communication Connectors








TE Connectivity's High Speed Data (HSD) Communication Connector portfolio is designed for high speed data transmission to meet automotive requirements up to 3Gbps. This highly robust and fully shielded system is designed to provide high-speed connectivity solutions for applications such as in-vehicle infotainment modules, cameras, consumer ports and display units. TE's HSD Connectors are designed for differential data transmission that offers excellent Electromagnetic Interference (EMI) performance. EMI emissions are minimal from a differential pair, as compared to single ended systems, due to the positive and negative signals effectively canceling each other out. Similarly, incoming noise will effect both conductors equally, which can easily be removed by the receiver



PRODUCT BENEFITS

- Full range of connectors for unsealed and sealed applications
- High level of process automation and global manufacturing footprint
- Compatible with the German AK HSD interface
- Impedance optimized HF Design supported by stamped signal pin profiles
- Fully automated diecast header production

APPLICATIONS

 ADAS Controller ●	 Telemetry Unit ●	 Network Backbone ●
 Multimedia/ Infotainment ●	 Camera ●	 Instrument Cluster ●
 Displays ●	 Service Port ●	

● Available in Cabin

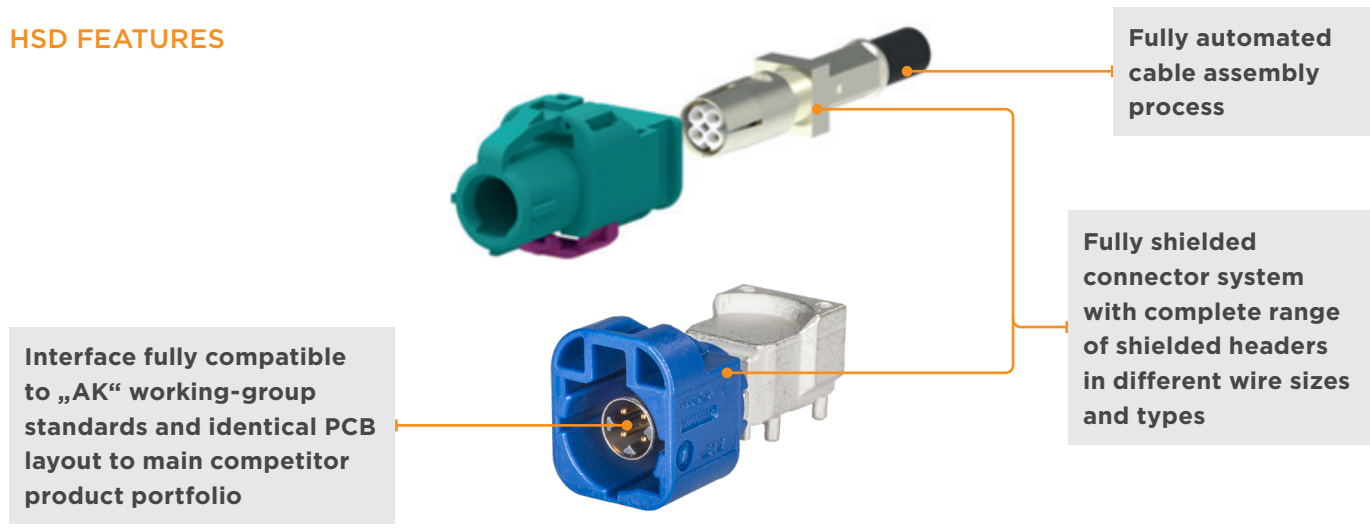
PRODUCTS

See product table below

SPECIFICATIONS

Application Specifications	114-94381 114-18867 114-94117 114-94058
Product Specifications	108-94479 108-94331 108-94433 108-94434
Brochure	1-1773982-3

HSD FEATURES

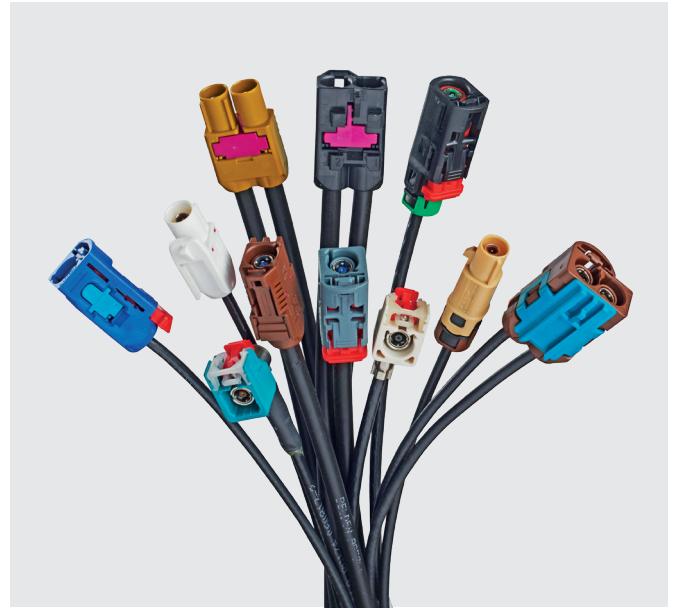


Part Number	Description	Sample available
X-1823898-X	Standard 180° Plug	Yes
X-1823905-X	Standard 180° Jack	Yes
X-2208145-X	Standard 90° Plug	Yes
X-1823853-X	Standard Sealed 180° Plug	Yes
X-1823857-X	Standard Sealed 180° Jack	Yes
X-2324148-X	Standard Sealed 90° Plug	Yes
X-2324148-X	Dual 180° Plug 12.7 mm	Yes
X-2236891-X	Dual 180° Plug 8 mm	Yes
X-2236888-X	Dual 90° Plug 12.7 mm	Yes
X-2177694-X	Hybrid (HSD + MQS) 180° + 2 MQS Plug	Yes
X-2177954-X	Hybrid (HSD + MQS) 180° + 2 MQS Jack	Yes
X-2236326-X	Hybrid (HSD + MQS) 90° + 2 MQS Plug	Yes
X-2286546-X	Standard 90° Diecast Header	Yes
X-2286550-X	Hybrid (HSD + MQS) 90° + 2 MQS Header	Yes
X-2286797-X	Shielded 90° Diecast Header	Yes
2236886-X	Standard 180° Diecast Header	Yes

For a full list of part numbers, view the [HSD Communication Connectors brochure](#).

FAKRA Connector System

The industrial and commercial transportation market is experiencing tremendous growth in telematics and multimedia applications that require high frequency transmission systems. Today's equipment features high-tech GPS, digital satellite radios, mobile phone connectivity, and mobile television systems. The FAKRA connector system meets the growing demand for infotainment applications using coaxial wiring products.



PRODUCT BENEFITS

- Compliant with USCAR 18 Interface requirements
- Wide portfolio supporting all your design and application needs
- Supporting bandwidths to address all future application requirements up to 6 GHz (FAKRA Automated)
- FAKRA Automated optimized for automated manufacturing

APPLICATIONS



ADAS Controller ●



Antenna ●



Camera ●



Radar/Lidar ●



Displays ●



Multimedia/
Infotainment ●



Telemetry Unit ●



Instrument Cluster ●

● Available in Cabin

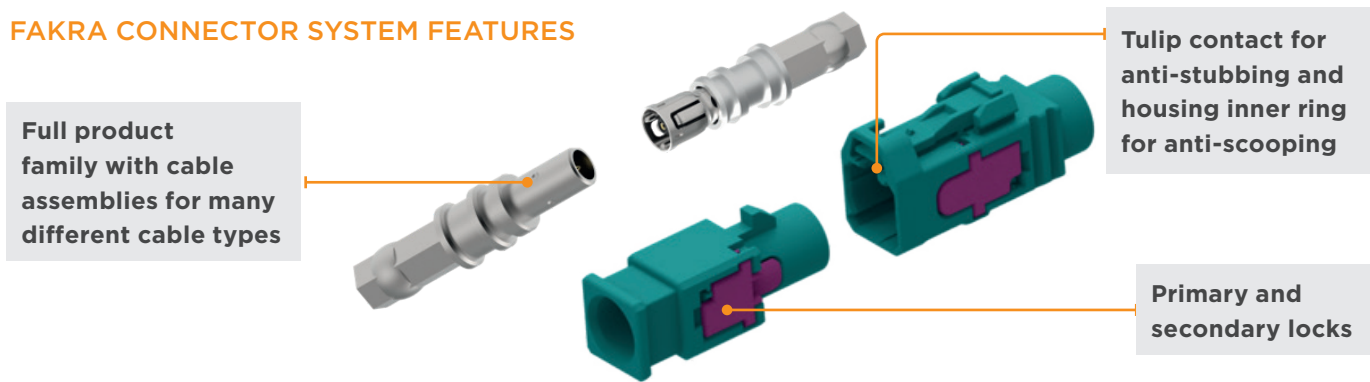
PRODUCTS

See product table below

SPECIFICATIONS

Full Line Catalog	1308073-3
Brochure	2-1773982-4
Product Specification	108-94089
Product Specifications Automated Header	108-18079, 108-132071 108-32058
Application Specification	114-18623
Application Specifications Automated Header	114-32108

FAKRA CONNECTOR SYSTEM FEATURES



Part Number	Description	Sample available
2098287-1	FAKRA Gen4 Male Plug Kit RTK031	Yes
2098288-1	FAKRA Gen4 Female Housing Kit RTK031	Yes
2035049-1	FAKRA Gen4 2 Pos	Yes
1719261-2	FAKRA II Right-Angle	Yes
1452584-1	FAKRA II Female Housing Kit	Yes
1452480-1	FAKRA II 2 Pos	Yes
2287903-1	FAKRA II Board Right-Angle	Yes
X-2203452-X	FAKRA Automated Header 1 pos 180°	Yes
X-2291392-X	FAKRA Automated Header 1 pos 90°	Yes
X-2209201-X	FAKRA Automated Header 1 pos 90° with shield	Yes
X-2287906-X	FAKRA Automated Header 1 pos 90° Edge mount	Yes
X-2272788-X	FAKRA Automated Header 2 pos 180°	Yes
X-2287923-X	FAKRA Automated Header 2 pos 180° edge mount	Yes

xxx-1 Code A / xxx-2 Code B / refer customer drawings for further codings

CONTACT KIT PART NUMBERS FOR RTK 031 CABLES

Description	GEN4 PN	FAKRA II PN
180° Male contact	1438890-7*	1488171-2*
180° Female contact	1438896-2*	1488175-2*
90° Female contact	1438896-2**	1719252-1

* Representative part numbers, for other configurations and acceptable cable types, see full line catalog.

** FAKRA Gen4 uses same contact part number for 1800 and 900 housings.

For a full list of part numbers, view the [FAKRA Stamped and Formed Terminal and Connector System brochure](#).



Cable Assembly for Harsh Environments

As data transmission frequencies increase, cable assembly termination quality and process become more technical and critical. TE's cable assembly capabilities support these critical processes for your prototyping, pre-production, and production needs.

Our specialized products provide severe vibration and mechanical shock resistance and allow field maintenance in harsh environments such as those in which commercial vehicles operate. This includes situations involving dust, dirt, and moisture, and temperature ranges of -40°C to +125°C.

They can adapt to virtually any use, including:



ADAS Controller ●



Antenna ●



Camera ●



Displays ●



GPS ●



Instrument Cluster ●



Multimedia/
Infotainment ●



Network Backbone ●



Radar/Lidar ●



Sealed Controller ●



Service Port ●



Sensors ●



Gateway/Switch ●



Telemetry Unit ●



V2X ●

Info: Contact your TE representative of custom length cable assemblies. Different housings like mentioned in the product sections above for each off-the-shelf cable assembly types can be ordered separately.

● Available in Chassis ● Available in Cabin

ASSEMBLY CHART

Product Line	Cable Type	TE Parent PN	Dash No.	Length (mm)	Configuration Name	Alias PN
MATenet Interconnection System	Dacar 647 - STP (1Gb)	2362347	-1	500	MATenet female insert to female insert	STPA-MNFI-MNFI-500
			-2	1000		STPA-MNFI-MNFI-1000
			-3	1500		STPA-MNFI-MNFI-1500
			-4	3000		STPA-MNFI-MNFI-3000
			-5	5000		STPA-MNFI-MNFI-5000
		2362348	-1	500	MATenet male insert to female insert	STPA-MNMI-MNFI-500
			-2	1000		STPA-MNMI-MNFI-1000
			-3	1500		STPA-MNMI-MNFI-1500
			-4	3000		STPA-MNMI-MNFI-3000
			-5	5000		STPA-MNMI-MNFI-5000
		2362349	-1	500	MATenet female 1-port to female 1-port	STPA-MNF1UA-MNF1UA-500
			-2	1000		STPA-MNF1UA-MNF1UA-1000
			-3	1500		STPA-MNF1UA-MNF1UA-1500
			-4	3000		STPA-MNF1UA-MNF1UA-3000
			-5	5000		STPA-MNF1UA-MNF1UA-5000
		2362350	-1	500	MATenet male 1-port to female 1-port	STPA-MNMCUA-MNF1UA-500
			-2	1000		STPA-MNMCUA-MNF1UA-1000
			-3	1500		STPA-MNMCUA-MNF1UA-1500
			-4	3000		STPA-MNMCUA-MNF1UA-3000
			-5	5000		STPA-MNMCUA-MNF1UA-5000
		2362351	-1	500	MATenet sealed female 1-port to sealed female 1-port	STPA-MNF1SA-MNF1SA-500
			-2	1000		STPA-MNF1SA-MNF1SA-1000
			-3	1500		STPA-MNF1SA-MNF1SA-1500
			-4	3000		STPA-MNF1SA-MNF1SA-3000
			-5	5000		STPA-MNF1SA-MNF1SA-5000
		2362352	-1	500	MATenet sealed male 1-port to sealed female 1-port	STPA-MNMCSA-MNF1SA-500
			-2	1000		STPA-MNMCSA-MNF1SA-1000
			-3	1500		STPA-MNMCSA-MNF1SA-1500
			-4	3000		STPA-MNMCSA-MNF1SA-3000
			-5	5000		STPA-MNMCSA-MNF1SA-5000

CABLE ASSEMBLY

ASSEMBLY CHART (continued)

Product Line	Cable Type	TE Parent PN	Dash No.	Length (mm)	Configuration Name	Alias PN
MATenet Interconnection System	Dacar 546 - UTP (100Mb)	2376737	-1	500	MATenet female insert to female insert	UTPA-MNFI-MNFI-500
			-2	1000		UTPA-MNFI-MNFI-1000
			-3	1500		UTPA-MNFI-MNFI-1500
			-4	3000		UTPA-MNFI-MNFI-3000
			-5	5000		UTPA-MNFI-MNFI-5000
		2376738	-1	500	MATenet male insert to female insert	UTPA-MNMI-MNFI-500
			-2	1000		UTPA-MNMI-MNFI-1000
			-3	1500		UTPA-MNMI-MNFI-1500
			-4	3000		UTPA-MNMI-MNFI-3000
			-5	5000		UTPA-MNMI-MNFI-5000
		2376739	-1	500	MATenet female 1-port to female 1-port	UTPA-MNF1UA-MNF1UA-500
			-2	1000		UTPA-MNF1UA-MNF1UA-1000
			-3	1500		UTPA-MNF1UA-MNF1UA-1500
			-4	3000		UTPA-MNF1UA-MNF1UA-3000
			-5	5000		UTPA-MNF1UA-MNF1UA-5000
		2376740	-1	500	MATenet male 1-port to female 1-port	UTPA-MNMCUA-MNF1UA-500
			-2	1000		UTPA-MNMCUA-MNF1UA-1000
			-3	1500		UTPA-MNMCUA-MNF1UA-1500
			-4	3000		UTPA-MNMCUA-MNF1UA-3000
			-5	5000		UTPA-MNMCUA-MNF1UA-5000
		2376741	-1	500	MATenet sealed female 1-port to sealed female 1-port	UTPA-MNF1SA-MNF1SA-500
			-2	1000		UTPA-MNF1SA-MNF1SA-1000
			-3	1500		UTPA-MNF1SA-MNF1SA-1500
			-4	3000		UTPA-MNF1SA-MNF1SA-3000
			-5	5000		UTPA-MNF1SA-MNF1SA-5000
		2376742	-1	500	MATenet sealed male 1-port to sealed female 1-port	UTPA-MNMCSA-MNF1SA-500
			-2	1000		UTPA-MNMCSA-MNF1SA-1000
			-3	1500		UTPA-MNMCSA-MNF1SA-1500
			-4	3000		UTPA-MNMCSA-MNF1SA-3000
			-5	5000		UTPA-MNMCSA-MNF1SA-5000

ASSEMBLY CHART (continued)

Product Line	Cable Type	TE Parent PN	Dash No.	Length (mm)	Configuration Name	Alias PN		
MATenet Interconnection System	Dacar 647 - UTP (1Gb)	2362764	-4	2000	Female insert - Female Insert, Dacar 647	-		
			-5	2500		-		
			-6	3000		-		
			-7	5000		-		
			-8	7500		-		
			-9	10000		-		
			1-x-0	15000		-		
		2362767	-1	1200	Female insert - Male insert, Dacar 647	-		
			-2	2000		-		
			-3	2500		-		
			-4	3000		-		
			-5	7500		-		
		2362768	-1	1000	Female Insert - Pigtail, Dacar 647	-		
		enetSEAL+ Connector System	Champlain 20AWG	2362353	-1	500	enetSEAL+ Female assy to Female assy	UTPB-ESFSA-ESFSA-500
					-2	1000		UTPB-ESFSA-ESFSA-1000
-3	1500				UTPB-ESFSA-ESFSA-1500			
-4	3000				UTPB-ESFSA-ESFSA-3000			
-5	5000				UTPB-ESFSA-ESFSA-5000			
2362354	-1			500	enetSEAL+ Male assy to Female assy	UTPB-ESMSA-ESFSA-500		
	-2			1000		UTPB-ESMSA-ESFSA-1000		
	-3			1500		UTPB-ESMSA-ESFSA-1500		
	-4			3000		UTPB-ESMSA-ESFSA-3000		
	-5			5000		UTPB-ESMSA-ESFSA-5000		
enetSEAL+ Connector System	Dacar 546			2373781	-1	500	enetSEAL+ Female assy to Female assy	UTPB-ESFSA-ESFSA-500
					-2	1000		UTPB-ESFSA-ESFSA-1000
					-3	1500		UTPB-ESFSA-ESFSA-1500
					-4	3000		UTPB-ESFSA-ESFSA-3000
					-5	5000		UTPB-ESFSA-ESFSA-5000
		2373785	-1	500	enetSEAL+ Male assy to Female assy	UTPB-ESMSA-ESFSA-500		
			-2	1000		UTPB-ESMSA-ESFSA-1000		
			-3	1500		UTPB-ESMSA-ESFSA-1500		
			-4	3000		UTPB-ESMSA-ESFSA-3000		
			-5	5000		UTPB-ESMSA-ESFSA-5000		

CABLE ASSEMBLY

ASSEMBLY CHART (continued)

Product Line	Cable Type	TE Parent PN	Dash No.	Length (mm)	Configuration Name	Alias PN
AMPSEAL 16 Connector / MATE-AX Interconnection System	RTK031	2362355	-1	500	MATE-AX 180° Female terminal to 180° Female terminal	CXA-MAF1UZ-MAF1UZ-500
			-2	1000		CXA-MAF1UZ-MAF1UZ-1000
			-3	1500		CXA-MAF1UZ-MAF1UZ-1500
			-4	3000		CXA-MAF1UZ-MAF1UZ-3000
			-5	5000		CXA-MAF1UZ-MAF1UZ-5000
		2362356	-1	500	MATE-AX 180° Male terminal to 180° Female terminal	CXA-MAM1UZ-MAF1UZ-500
			-2	1000		CXA-MAM1UZ-MAF1UZ-1000
			-3	1500		CXA-MAM1UZ-MAF1UZ-1500
			-4	3000		CXA-MAM1UZ-MAF1UZ-3000
			-5	5000		CXA-MAM1UZ-MAF1UZ-5000
		2362357	-1	500	MATE-AX 180° Female terminal to Fakra 180° Female terminal	CXA-MAM1UZ-FAF1UZ-500
			-2	1000		CXA-MAM1UZ-FAF1UZ-1000
			-3	1500		CXA-MAM1UZ-FAF1UZ-1500
			-4	3000		CXA-MAM1UZ-FAF1UZ-3000
			-5	5000		CXA-MAM1UZ-FAF1UZ-5000
AMPSEAL 16 Connector / MATE-AX Interconnection System	Dacar 462-6	2362358	-1	500	MATE-AX 180° Female terminal to 180° Female terminal	CXB-MAF1UZ-MAF1UZ-500
			-2	1000		CXB-MAF1UZ-MAF1UZ-1000
			-3	1500		CXB-MAF1UZ-MAF1UZ-1500
			-4	3000		CXB-MAF1UZ-MAF1UZ-3000
			-5	5000		CXB-MAF1UZ-MAF1UZ-5000
		2362359	-1	500	MATE-AX 180° Male terminal to 180° Female terminal	CXB-MAM1UZ-MAF1UZ-500
			-2	1000		CXB-MAM1UZ-MAF1UZ-1000
			-3	1500		CXB-MAM1UZ-MAF1UZ-1500
			-4	3000		CXB-MAM1UZ-MAF1UZ-3000
			-5	5000		CXB-MAM1UZ-MAF1UZ-5000
		2362360	-1	500	MATE-AX 180° Female terminal to FAKRA 180° Female terminal	CXB-MAM1UZ-FAF1UZ-500
			-2	1000		CXB-MAM1UZ-FAF1UZ-1000
			-3	1500		CXB-MAM1UZ-FAF1UZ-1500
			-4	3000		CXB-MAM1UZ-FAF1UZ-3000
			-5	5000		CXB-MAM1UZ-FAF1UZ-5000

ASSEMBLY CHART (continued)

Product Line	Cable Type	TE Parent PN	Dash No.	Length (mm)	Configuration Name	Alias PN
DT Highspeed	Jacketed STP 20AWG	2382948	-1	500	DT Highspeed Female-to-Female Assembly	-
			-2	1000		-
			-3	1500		-
			-4	3000		-
			-5	5000		-
			-6	7500		-
			-7	10000		-
			-8	28000		-
	Jacketed STP 20AWG	2382949	-1	500	DT Highspeed Male-to-Female Assembly	-
			-2	1000		-
			-3	1500		-
			-4	3000		-
			-5	5000		-
			-6	7500		-
			-7	<u>10000</u>		-

SMART PART NUMBER-ALIAS CONFIGURATOR

CABLE ASSEMBLY



C	Cable Type	ID
UTPA	Unshielded Twisted Pair	Dacar 547-D
UTPB		Champlain 20 AWG
UTPC		Dacar 647
UTPD		Dacar 546
STPA	Shielded Twisted Pair	Dacar 647-4
STPB		Champlain 23 AWG
CXA	Coaxial	RTK031
CXB		Dacar 462-6
CXC		RG-174
CXD		RG-58

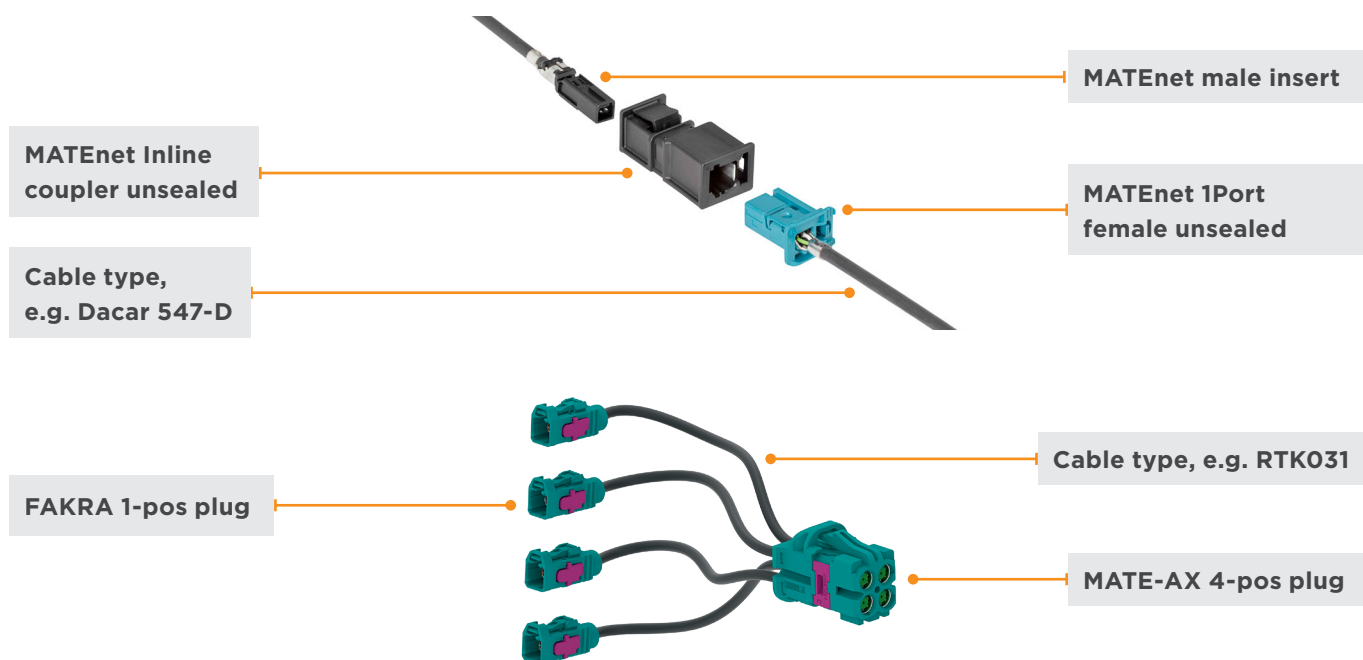
S	Connector Series
MN	MATenet Interconnection System
MA	MATE-AX Interconnection System
FA	FAKRA II Connector System
F4	FAKRA IV Connector System
ES	enetSEAL+ Connector System

G	Gender
M	Male
F	Female

K	Key
A	Key A
Z	Key Z

V	Variant
I	MATenet Insert
F1U	MATenet/MATE-AX/FAKRA 1Port Frame/ 1pos Female unsealed
CU	MATenet Inline Coupler unsealed
F1S	MATenet 1Port Frame sealed
CS	MATenet Inliner Sealed
M1U	MATE-AX Male 1pos unsealed
FS	Female Sealed, 2P
MS	Male Sealed, 2P

L	Length
500	500 mm
1000	1000 mm
1500	1500 mm
3000	3000 mm
5000	5000 mm



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 more than 85,000 employees, including over 8,000 engineers, working alongside customers in approximately 140 countries, TE ensures that EVERY CONNECTION COUNTS. Learn more at www.te.com and on LinkedIn, Facebook, WeChat and Twitter.

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