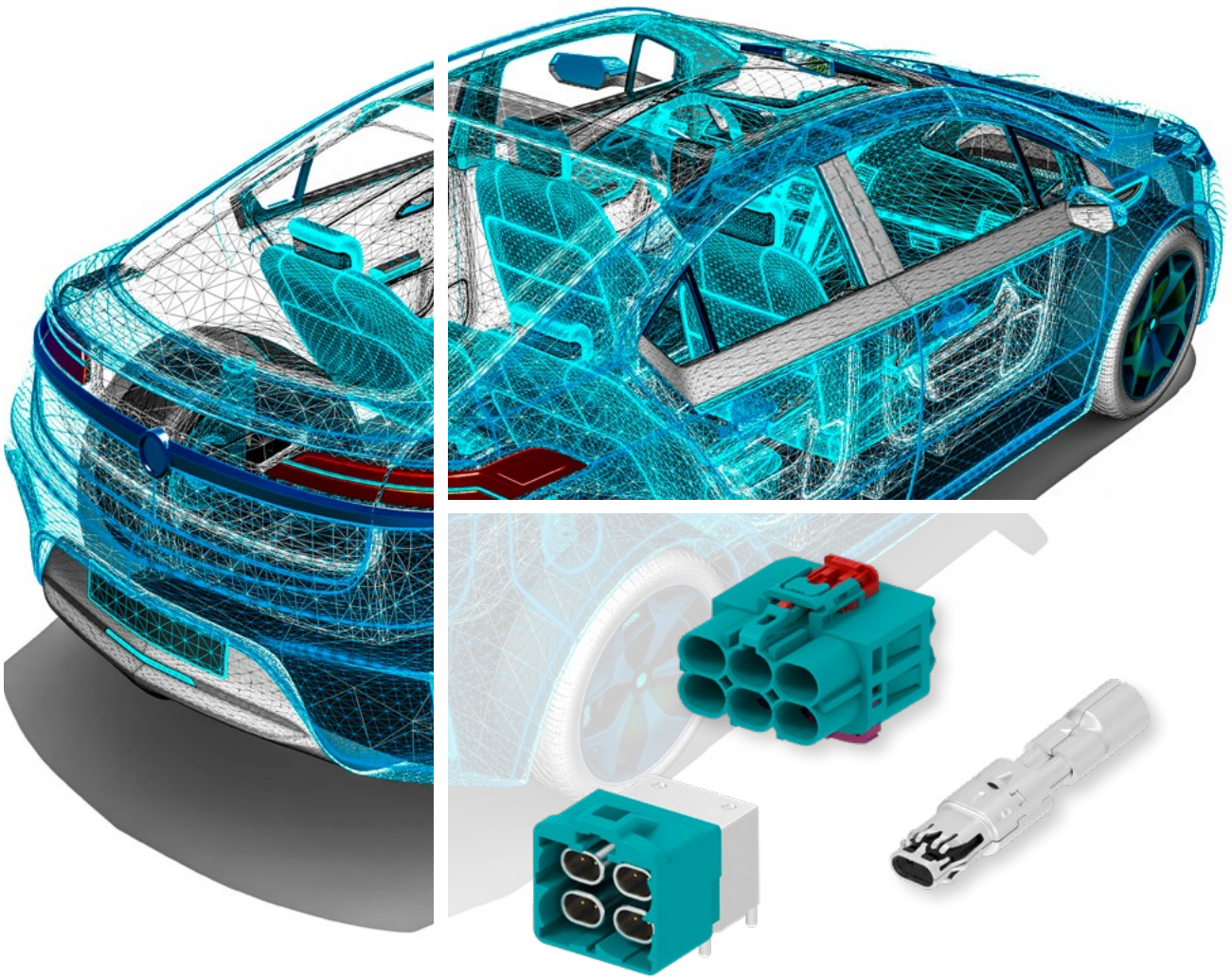
GEMnet MULTI-GIGABIT DIFFERENTIAL CONNECTOR SYSTEM

Enabling 15 GHz and up to 56 Gbps Performance
for the Automotive Industry



Automotive manufacturers are increasingly utilizing multi-gigabit (10Gbps+) data links to design applications and architectures. Designed to meet these requirements, TE Connectivity's (TE) GEMnet connector family supports Multigigabit Ethernet and SerDes applications; provides bandwidth up to 15 GHz and able to support data transmission up to 56 Gbps.

The GEMnet connector system offers the flexibility to support a wide range of Ethernet applications and industry protocols including 4K displays, radar/lidar, high-resolution camera and safety critical applications.

The GEMnet connector system features 90° and 180° terminals and offers sealed and unsealed product types. Compatible with USCAR interface, the GEMnet connector system can be used with variety of different cables including Shielded Twisted Pair, Unshielded Twisted Pair and new high-performance cables. The GEMnet connector system provides automotive manufacturers with a high-performance connector system that supports current and future vehicle requirements with automotive grade robustness.

Automotive-Grade Design

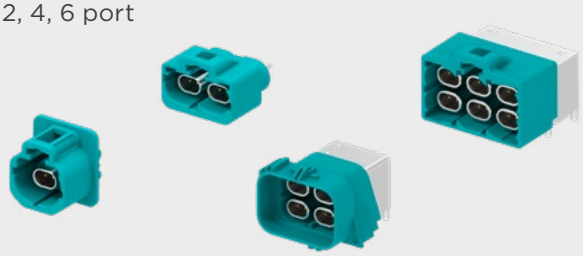
The GEMnet connector family has been designed specifically for automotive applications and includes. a primary and secondary lock, crimp connection, high cable retention force, high coding efficiency, anti-stubbing, anti-scooping, connector position assurance (CPA) protection and Poke-yoke with terminal polarization. In addition, The GEMnet connector family offers specific advantages in terms of automotive robustness, which include the robust ground contact design and integrated lead-in features and stub protection. The multiple contact points allow the GEMnet connector system to offer sufficient EMI performance. Featuring USCAR interface, GEMnet is an automotive grade connector system that can be used in a broad array of automotive applications.

Terminal

- 90 and 180 degree

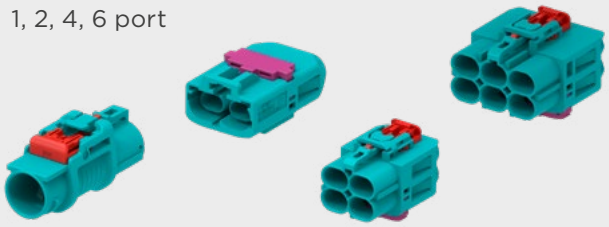
Header

- 90 and 180 degree header (sealed and unsealed)
- 1, 2, 4, 6 port

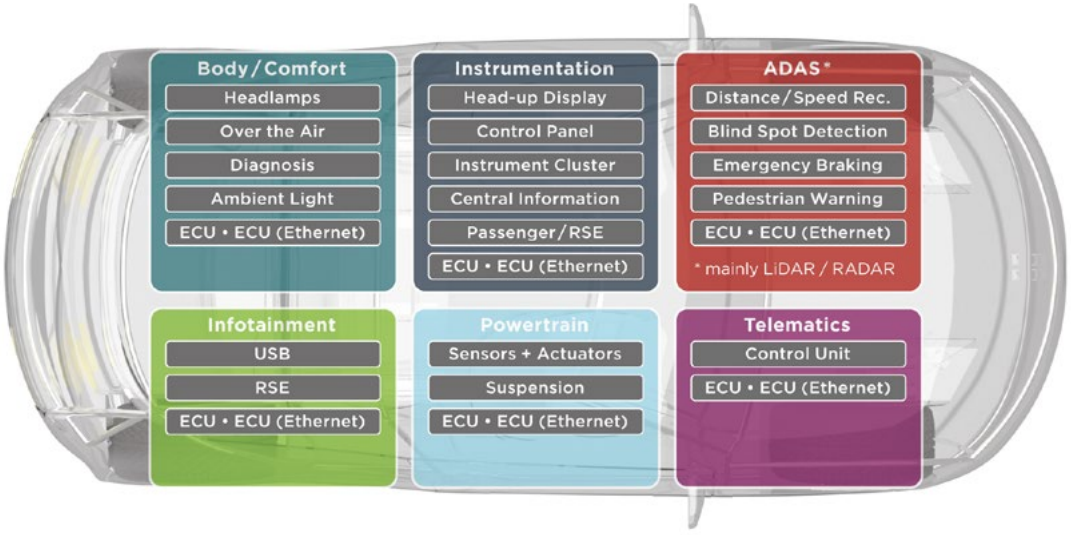


Housing

- 180° male and female housing, 90° female (sealed and unsealed)
- 1, 2, 4, 6 port



EXAMPLE APPLICATIONS



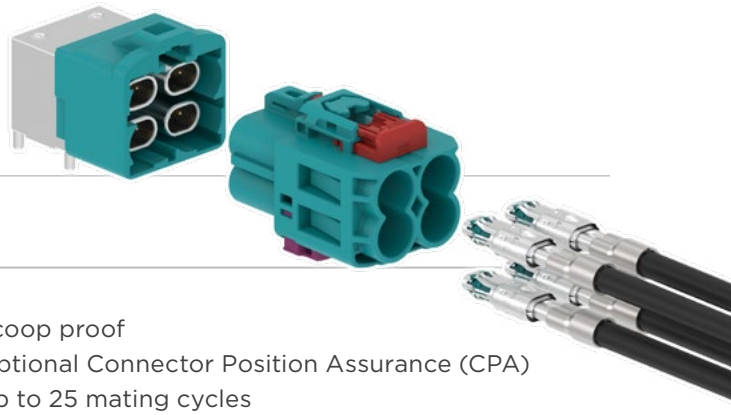
PRODUCT OVERVIEW

Performance

Performance	Standards Conformance
Up to 56 Gbps* 15 GHz 100 Ohm impedance	TC9, IEEE802.3ch, APIX 3, PCIe Gen 4, GMSL2/3, FPD-Link III/IV

Applications

Protocols Supported		Functional Applications
Ethernet	100BASE-T1 1000BASE-T1 2.5/5/10/25GBASE-T1	• Camera systems (4K and beyond) • Driver assistance systems • Automated driving functions • High resolution displays • Rear seat entertainment • Compliant to USCAR
SerDes	APIX® FPD-Link GMSL™ MIPI® A-PHY℠ PCIe® USB GVIF HDBase-T™ ASA Motion Link	
Other	USB PCIe®	



Mechanical Features

- Primary and secondary locking
- Robust crimp design
- High cable retention force
- Anti-stubbing pin protection

- Scoop proof
- Optional Connector Position Assurance (CPA)
- Up to 25 mating cycles

*depending on chipset modulation, cable type & cable length

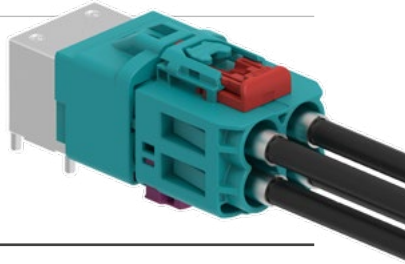
TE Connectivity's GEMnet connector system product range is based around 90° and 180° terminals and consists of sealed and unsealed PCB connectors (headers) and housings and cable assemblies.

PRODUCT OVERVIEW

Mechanical Performance	
Mating Cycles	≥ 25
Connector Engagement Force	1 Port ≤ 20 N 2 Port ≤ 35 N 4 Port ≤ 50 N 6 Port ≤ 75 N
Connector Disengage Force (Lock Enabled)	≥ 110 N
Connector Disengage Force (Lock Disabled)	≥ 5 N and ≥ 75 N
Polarization Feature Effectiveness	1 Port ≤ 20 N 2 Port ≤ 35 N 4 Port ≤ 50 N 6 Port ≤ 75N
Connector to Connector Audible Click	65 dB

Electrical Performance	
Impedance	100 ±10 Ohms
Isolation Resistance	≥ 100 mOhm
Working Voltage	≤ 60 V DC
Power Current	≤ 2 A DC
Signal Contact Resistance	≤ 40 mOhm
Outer Contact Resistance	Initial ≤ 25 mOhms Final ≤ 40 mOhms
Return Loss Single component, gated **	Initial ≤ 15 mOhms Final ≤ 25 mOhms
Return Loss – Mated Pair compliant with future standards (including Open Alliance TC9, IEEE 802.3cy)	≥ 25 dB up to 1.5 GHz ≥ 20 dB up to 4 GHz ≥ tbd. up to 9 GHz

Environment Performance*			
Temperature Range	-40°C to +105°C	**Dry Heat**	DIN IEC 60068 2-2 Test B Temperature +105°C SAE/ USCAR-2 Rev 7 (cable dependent)
Vibration	DIN IEC 60068-2-2 Test B Severity 1 SAE/USCAR-2 Rev 7, V1 (cable dependent)	**Humidity**	DIN IEC 60068-2-30 @ +40°C
Mechanical Shock	DIN-EN-60068-2-27 Severity 1 SAE/USCAR-2 Rev 7, V1	**Temperature/Humidity Cycling**	SAE/USCAR-2 Rev 7 V2
Thermal Shock	DIN-EN-60068-2-14 SAE/USCAR-2 Rev 7 -40°C to +105°C (cable dependent)	**Soldering Profile**	acc. to IEC 60068-2-58; Group 3 (+250°C/ 30 sec)



* OEM-specific validations to be completed as required

** Results dependent on maximum frequency of cable and mated precision adapter

GEMnet CONNECTOR SYSTEM

TERMINALS	Components	Components Part Number	Applicator Part Number
	Female Center Contact	2368012-1	3-2837971-2
	Female Outer Contact	2368036-1	3-2837986-2
	Ferrule	2368028-1	
	Male Center Contact	2368031-1	3-2837970-2
	Male Outer Contact	2368037-1	3-2837976-2
	Ferrule	2368028-1	

180° Female terminal set PN 2394484
180° Male terminal set PN 2394485

GEMnet CONNECTOR SYSTEM UNSEALED CONNECTORS

FEMALE HOUSINGS

	Ports	Orientation	CPA	Part Number	Key
	1	180°	Yes	2368022	A, B, C
	2	180°	Yes	2386612	A, B, C
	4	180°	Yes	2386629	A, B, C
	6	180°	Yes	2399595	A, B, C
	6	180°	No	2428482	A, B, C
	1	90°	Yes	2391002	A, B, C

MALE HOUSINGS

	Ports	Orientation	CPA	Clip	Part Number	Key
	1	180°	No	No	2368003	A, B
	1	180°	No	Yes	2-2368033	A, B
	1	180°	No	Yes	2368033	A, B
	2	180°	No	No	2386606	A, B
	2	180°	No	Yes	2-2386608	A, B
	2	180°	No	Yes	2386608	A, B

GEMnet CONNECTOR SYSTEM SEALED CONNECTORS

FEMALE HOUSINGS	Ports	Orientation	CPA	Part Number	Key
	1	180°	Yes	1802794	A, B, C
	4	180°	Yes	2420615	A, B, C

SINGLE WIRE SEAL	Ports	Orientation	CPA	Part Number
	1	180°	–	1802792-1

TPA	Ports	Orientation	CPA	Part Number
	1	180°	–	1802802-1

REAR COVER	Ports	Orientation	CPA	Part Number
	1	180°	–	1802803-1

GEMnet CONNECTOR SYSTEM PCB HEADERS

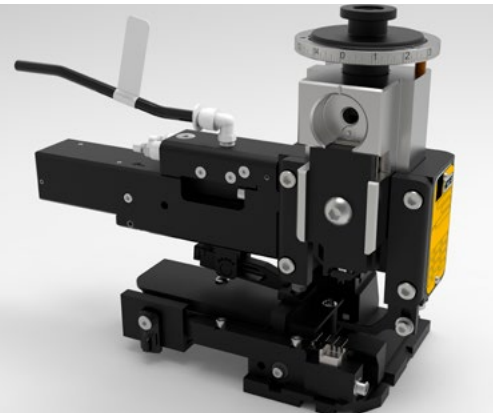
UNSEALED

	Ports	Orientation	PN
	1	90°	2374901
	2	90°	2374902
	4	90°	2374900
	6	90°	2397129
	1	180°	2397137
	2	180°	2409685
	4	180°	2408290
	6	180°	2390045

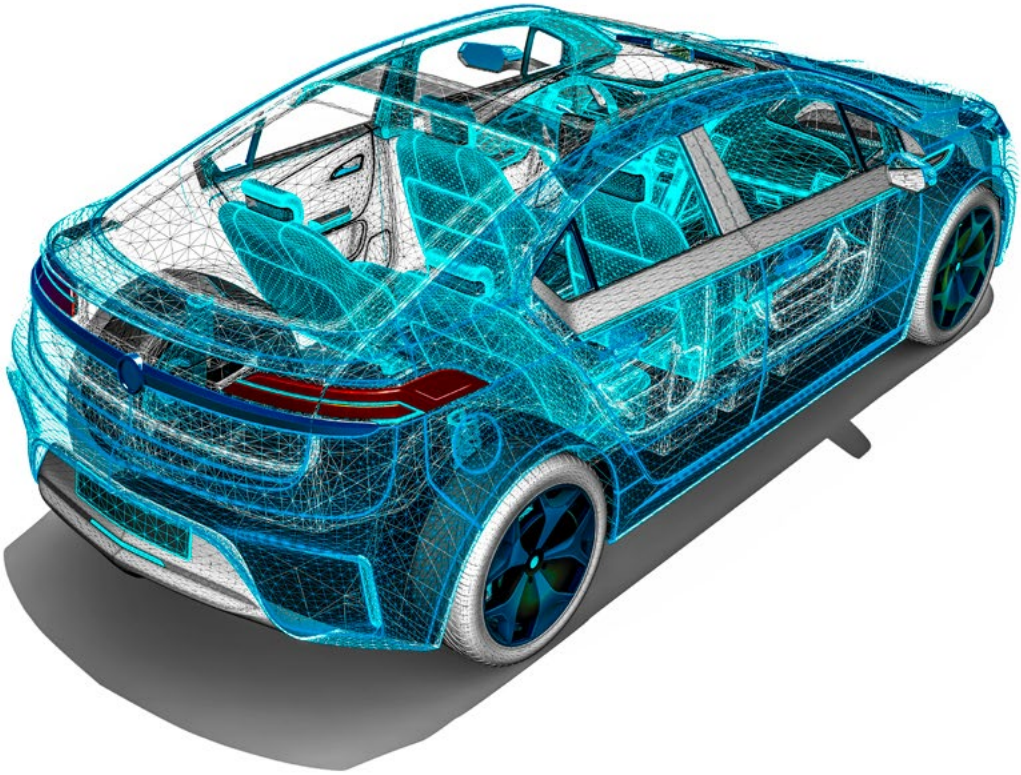
SEALED

	Ports	Orientation	PN
	1	90°	2397320
	4	90°	2397322
	1	180°	2397248

GEMnet CONNECTOR SYSTEM APPLICATION TOOLING



Applicator PN	Platform	Terminal PN
3-2837976-2	OCEAN	2368028-1
3-2837970-2	OCEAN	2368031-1
3-2837971-2	OCEAN	2368012-1
3-2837968-2	OCEAN	2368028-1 (2368036 female outer jacket)



FOR FURTHER INFORMATION PLEASE CONTACT US:

EUROPE

Germany

Product Information Center:
Phone: +800 0440-5100
Fax: +49 6251-133-1988
Email: ConnectedSales@te.com

UNITED STATES

United States – Harrisburg

Product Information Center:
Phone: +1 800 522-6752
Fax: +1 717-986-7575
Web: TE.com/customerservice

www.te.com

aut-dc-gemnet-br-en | Revision 11-2022

TE Connectivity Germany GmbH
Ampèrestrasse 12-14
64625 Bensheim / Germany