



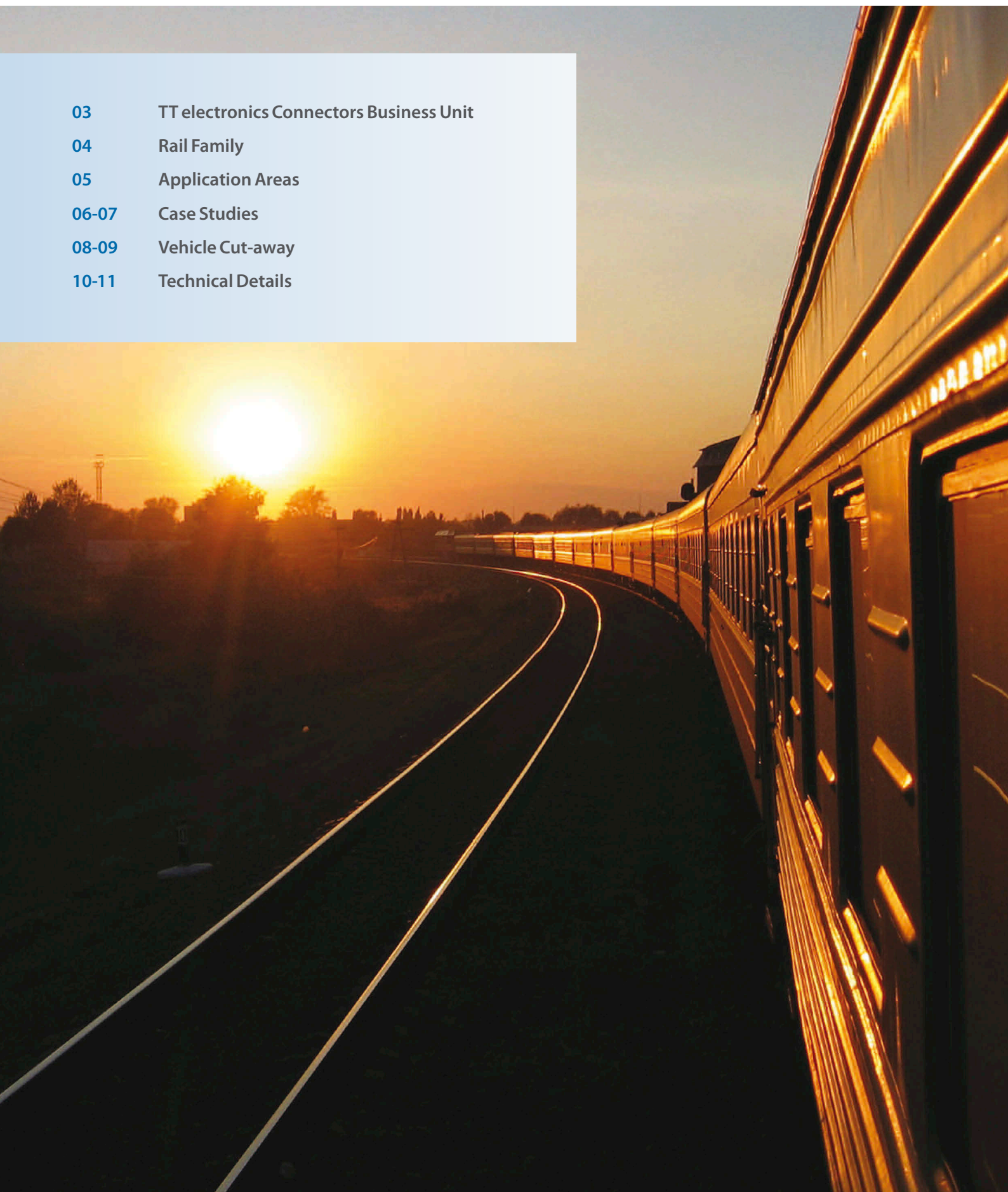
Rail Vehicles



Belief in Technology

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TT electronics Connectors Business Unit



When safety matters, the world's leading rail manufacturer's turn to TT electronics for exceptional design support.

About TT electronics

TT electronics plc is a global electronics company that has been supplying innovative high reliability components and assemblies to the world's rail transport manufacturers for more than 30 years. The knowledge and experience gained in that time has resulted in a dedicated team of industry experts who are available to advise and guide customers through even the most complex component requirements. Our industry experience and agile approach to business has given us a pre-eminent position in the supply of connectors and other components for rail network infrastructures and rolling stock.

As a major plc listed on the London stock exchange, TT electronics plc has the financial resources to continually invest in up-to-the-minute manufacturing facilities to address our customer's needs and provide them with the correct solution. With design and manufacturing plants in Europe and the USA, we are able to help rail manufacturers globally accelerate their design through to on-time market entry by supplying innovative rugged connectors and assemblies to the IRIS standard.

Modern rail transport applications present a harsh and unforgiving environment, where systems are subjected to vibration and temperature fluctuations. TT electronics' relentless focus on quality and compliance helps rail manufacturers focus on core activities, improving their time-to-market, lowering manufacturing costs and mitigating risk. Working closely on site with our OEM and ODM customers has given our engineering team a deep understanding of the changing market trends and regulations of the rail sector, enabling them to engineer the best possible component solution.

Rail Family

TT electronics' components division has multiple facilities for the design and manufacture of interconnection systems with engineering teams providing custom solutions.

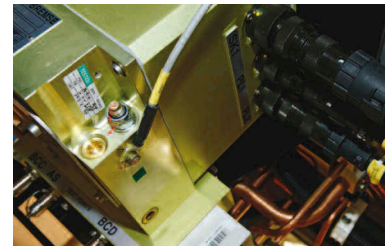
Rolling stock

Design, development and supply of interconnection solutions direct to major OEM partners.



Equipment

Comprehensive product portfolio for all electrical interfaces on all rail vehicles.



Infrastructure & signalling

Trackside and signalling cables and connectors.



Services

Innovative product solutions for upgrades and vehicle overhaul programmes, supporting the vehicle life cycle.



Application Areas

TT electronics' products can be found in all areas of the rail vehicle in power, control and communications systems.

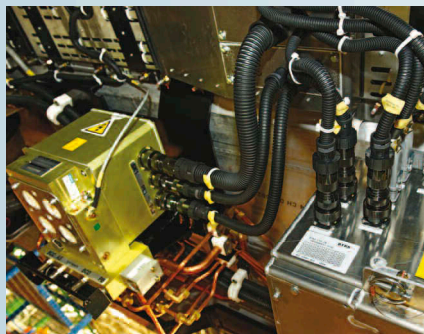
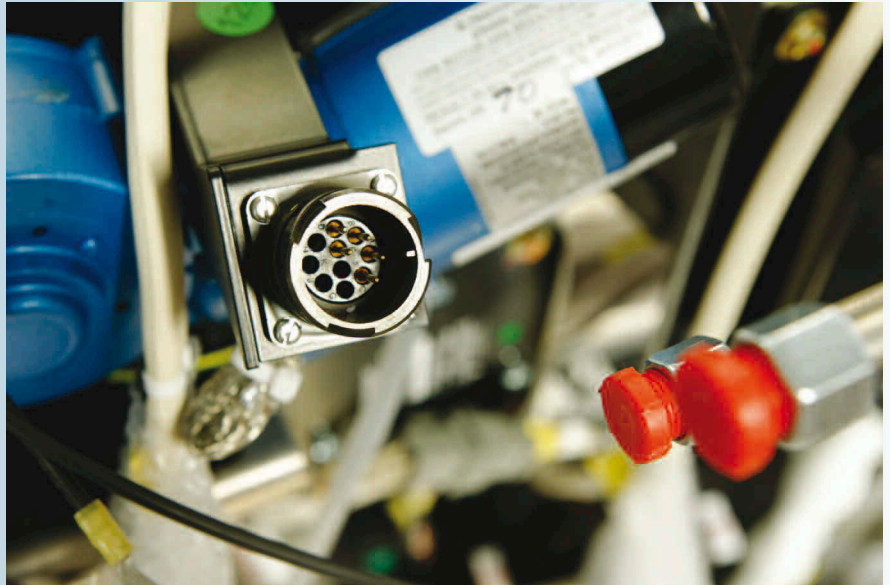
TT electronics' solutions

Rolling Stock

- Bogies
- Engine
- Brakes
- Inter-car connections
- Train communication systems
- Drivers cabin equipment
- Data storage & record
- Doors, ramps & access devices
- Screens & audio systems
- Lighting
- Phone & communications

Infrastructure

- Signalling & level crossing
- Warning systems
- Location systems
- Detection, measurement & control
- Safety & detection equipment
- Video surveillance
- Control, operation & communication



Case Studies

Interfleet Technology – Class 158 ERTMS upgrade

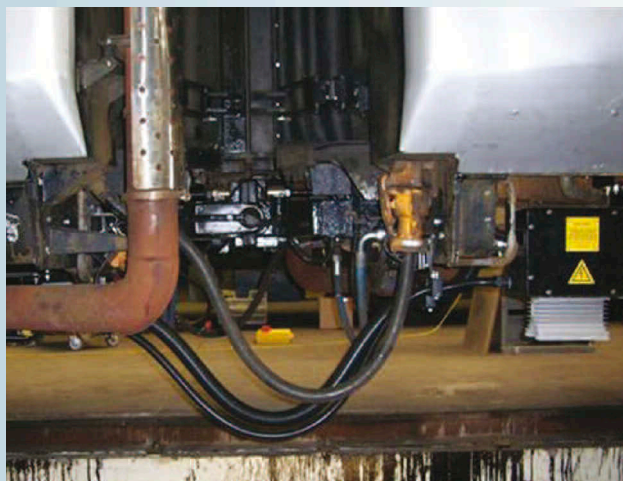
When Interfleet Technology was awarded the contract for the vehicle integration design and fleet fitment of the European Rail Traffic Management System (ERTMS) to the Class 158 Cambrian fleet, it turned to TT electronics Connectors Business Unit for bespoke jumper and cable harness solutions.

The ERTMS programme enables the speed and movement of trains to be continuously monitored and automatically controlled by signalling staff if required. The project required Interfleet Technology to fit a 19" cabinet housing the European Vital Computer (EVC), a touch screen driver-machine interface, Doppler radar, Euroblaise antennas, roof mounted GSM-R GPS and Data antennas. These complex systems are connected utilising a pre-tested, plug and play harness assembly designed by the team at TT electronics to reduce the vehicle downtime.

TT electronics was selected by Interfleet Technology for its proven track record in supplying and supporting the rail industry. Working closely with the Interfleet project team, the Connectors Business Unit developed a custom rugged inter-car jumper system designed to meet the signal requirements and harsh environmental conditions of the project.

"TT electronics has become a valued supplier, instrumental in enabling us to deliver this complex and challenging project on time. Prior knowledge and experience of the standards required by the Rail industry was a key consideration for us when selecting design partners and the team at the Connectors Business Unit ticked all the boxes."

Programme Manager – Rolling Stock, Interfleet Technology Ltd.



Petards eyeTrain on-train surveillance

The development of any CCTV surveillance system demands high quality reliable components matched with superior build quality. This is especially true when the surveillance system is mounted in a challenging passenger train environment. When Petards, the market leader in on-train CCTV solutions secured contracts for their high performance eyeTrain digital surveillance system, they turned to the engineering team at TT electronics for support.

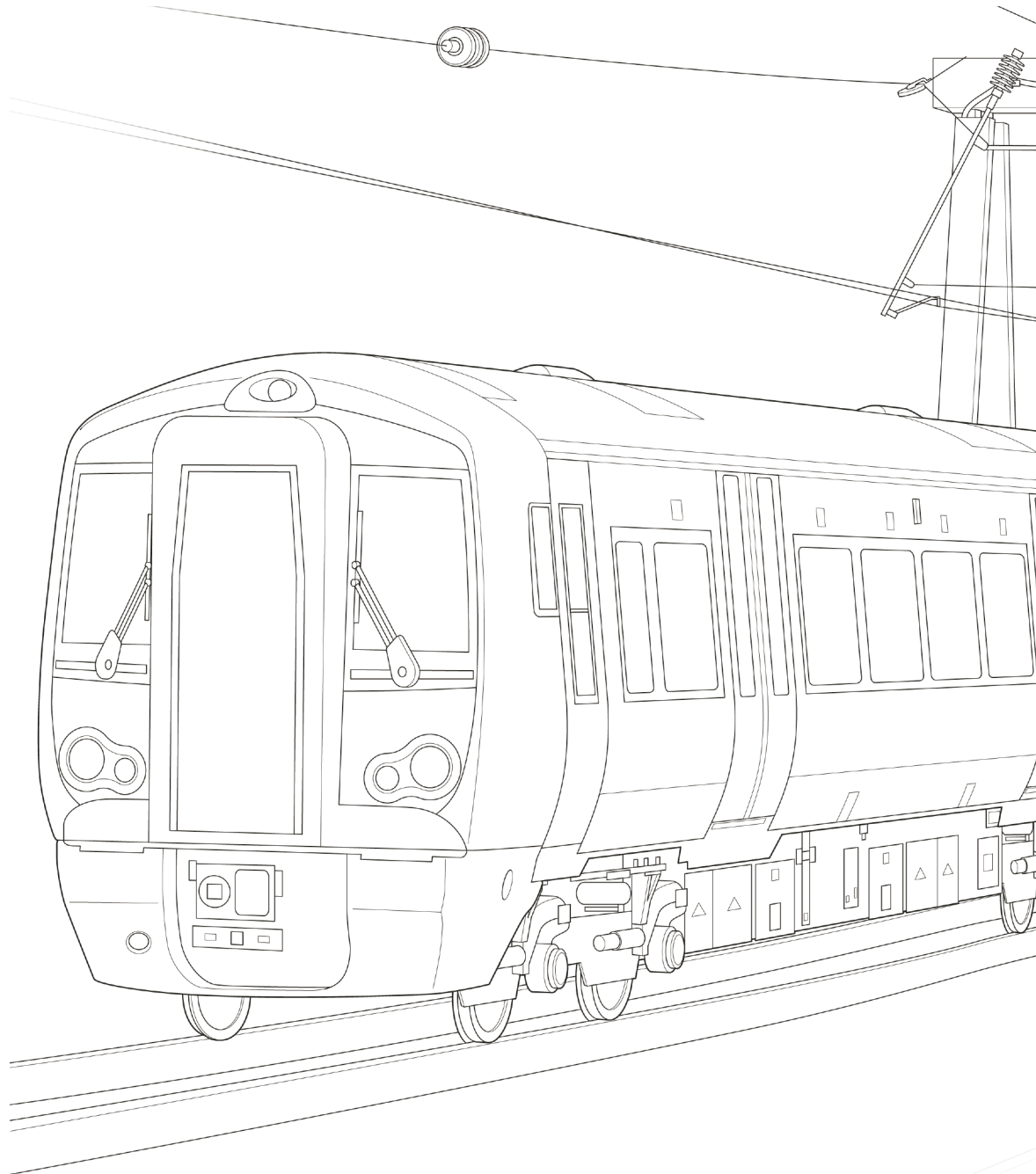
Effective transport surveillance systems have been shown to increase passenger security by deterring crime and anti-social behaviour. The installed systems need to remain operational in fluctuating temperatures and during extreme vibration conditions whilst providing instant high resolution images direct to the driver and storing them.

The team at TT electronics was able to meet these design challenges head-on with a flexible product offering that met the exacting standards of the rail industry. The AB Multipole high speed & signal data connector was selected by Petards for its simple yet robust characteristics.

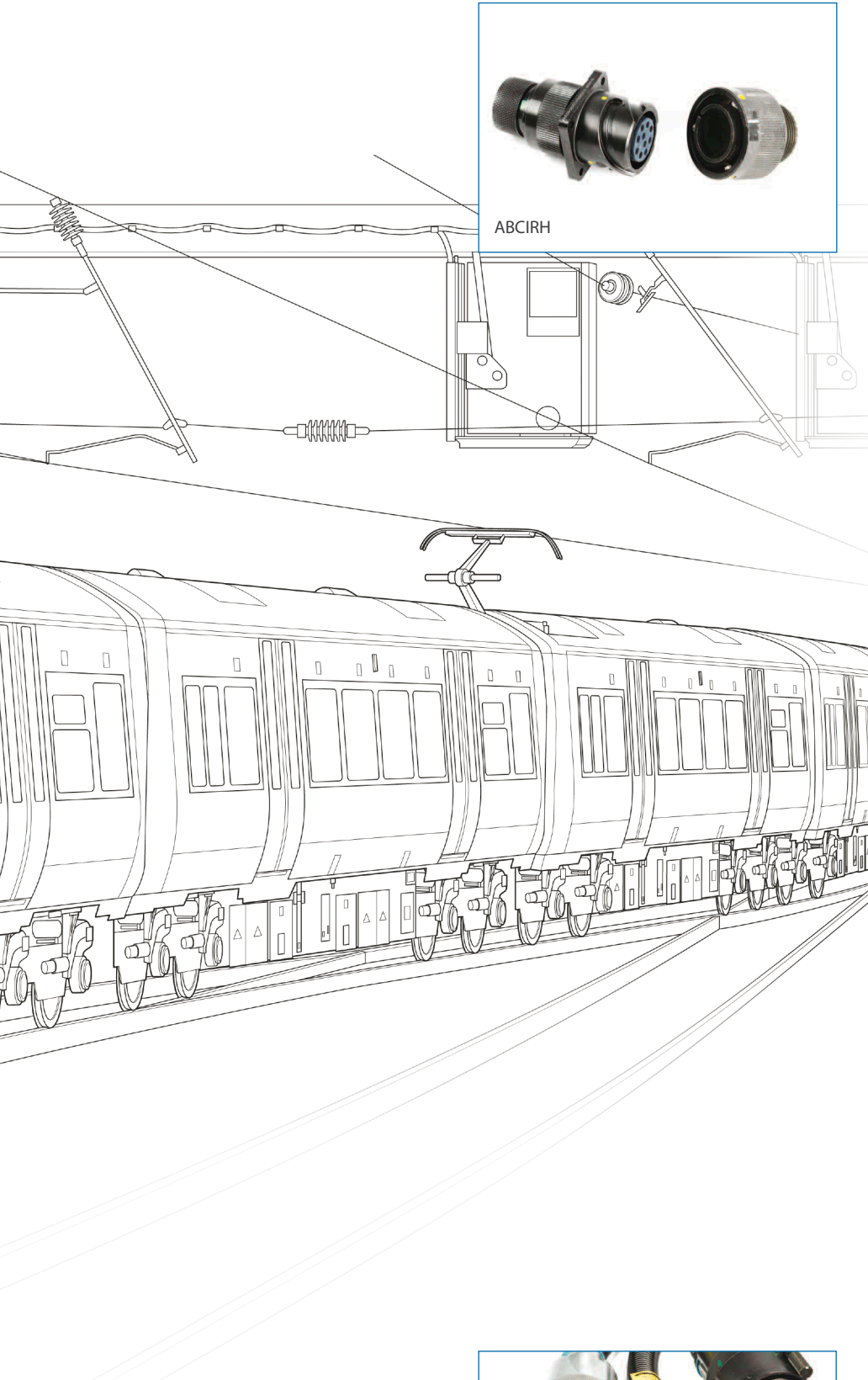
The innovative connector features a low fire hazard thermoplastic insulator, which is removable for repositioning and can withstand operational temperatures from -55°C to +125°C. The connector's IP67 rating alongside BSEN61373 Cat 1 Class A shock and vibration classification meant it was the ideal solution for several Petards passenger train upgrade projects in 2011.



Vehicle Cut-away



Electrical Box assembly



ABCIRH



ABCIRP



AB05H



ABMP



ABHC

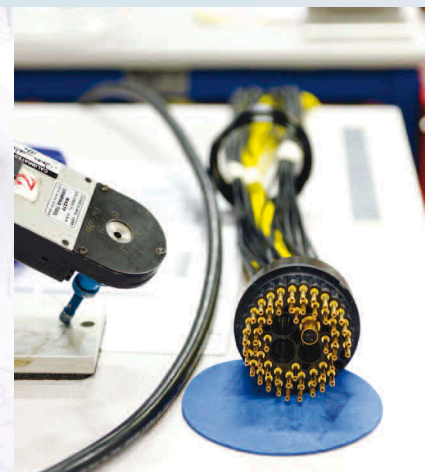


Inter-car Jumper and Harnessing



ABPF

Technical Details



ABCI RH

Mil-C-5015 style conforming to VG95234 and LUL standard. Reverse bayonet coupling connector with low fire hazard/halogen free rubber inserts. Contact rating from 7.5 amps to 500 amps; temperature rating from -55°C to +200°C; contact configuration from 1 to 85 ways.

Bespoke inserts are available to support specific customer requirements; power, signal and communication (Co-ax and Twin-ax).

ABCIR P

Mil-C-5015 style conforming to VG95234. Reverse bayonet coupling connector approved to NF-F-61-030 by SNCF, RATP, Alstom Transport and Bombardier meeting LUL standards. Low fire hazard thermoplastic inserts with metal clip retained contacts. Contact rating from 10 amps to 42 amps; temperature rating from -55°C to +125°C; contact configuration from 7 to 60 ways.

AB05H

Mil-C-26482 Series I style conforming to BS9522 F00017, CECC 75201003. Miniature bayonet coupling connector with halogen free rubber inserts. Contact rating from 7.5 amps to 13 amps; temperature rating from -55°C to +200°C; contact configuration from 1 to 85 ways.

ABBMS

Mil-C-5015 style conforming to BS9522-F0032 and VG95234. Reverse bayonet coupling connector with polychloroprene inserts. Contact rating from 7.5 amps to 500 amps; temperature rating from -55°C to +125°C; contact configuration from 1 to 61 ways.

UKAN

Mil-C-5015 style conforming to DEF5321. Fine screw coupling connector with silicone rubber inserts. Contact rating from 12 amps to 100 amps; temperature rating from -55°C to +190°C plus high temperature option with rating from -55°C to +1100°C (for 20 minutes); contact configuration from 1 to 61 ways.

ABHC (high current)

Reverse bayonet coupling connector with tapered contact designed to ensure low contact resistance under high rolling stock vibration levels. Low fire hazard thermoplastic inserts. Contact rating up to 1500 amps on 300mm²; temperature rating from -55°C to +180°C; 120mm², 240mm² and 300mm² crimp contact variations available.

ABPF

Three start threaded coupling connector conforming to CECC 75-201-007 with robust plastic body and anti-vibration feature. Low fire hazard/halogen free inserts. Contact rating from 7.5 amps to 500 amps on shell sizes 18, 22 and 28 with contact configuration from 2 to 37 ways.

ABIC (inter-car)

Unique reverse bayonet coupling connector for high dynamic inter-car applications designed with a lever handle for convenient coupling and secondary locking.

Bespoke inserts are available to support specific customer requirements; power, signal and communication (Co-ax, Twin-ax, Tri-ax and Quadrx). Temperature rating from -65°C to +125°C.

ABMP

Mil-C-5015 style conforming to BS9522-F0032 and VG95234. Reverse bayonet coupling connector with low fire hazard thermoplastic inserts. Tested for high speed data applications:

- 100 Base-Tx on Cat 5e: Single Quadrx;
- 1000 Base-Tx on Cat 5e: 2 x Quadrx.

Bespoke inserts are available to support specific customer requirements; signal and communication (Co-ax, Twin-ax, Tri-ax and Quadrx). Temperature rating from -55°C to +125°C.



	CONTROL 10A to 135A	SIGNAL	POWER Over 135A	HIGH SPEED Co-ax & Twin-ax	HIGH SPEED Tri-ax & Quadrax	INTER-CAR JUMPER	INTER-CAR JUMPER High dynamic application	FIRE BARRIER TESTING
ABCIRH	●	●		●		●		●
ABCIRP	●	●				●		●
ABO5H	●	●						●
ABBMS	●	●	●			●		
UKAN	●	●				●		●
ABHC			●			●	●	●
ABPF	●	●		●		●	●	
ABIC	●	●		●	●	●	●	●
ABMP	●	●		●	●	●	●	

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