



Railway Solutions

Booklet

SIMPLIFICATION IS OUR INNOVATION



Foreword

Railway systems demand different interconnect performance depending on where equipment is installed. From protected onboard electronics to exposed intercar connections and highly dynamic bogie environments, Radiall combines power, signal, data, fiber optic and RF technologies to deliver reliable connectivity throughout the railway system.





Meeting Connectivity Challenges



Shock & Vibration

Railway equipment is exposed to continuous mechanical shock throughout operation. Solutions must maintain secure connections and reliable performance under demanding conditions without loosening, degrading or interrupting critical power and signal transmission.



Environmental Exposure

Exterior railway equipment must operate through changing weather and harsh environmental conditions. Solutions require rugged materials and construction that maintain reliable performance across roof, exterior and trackside installations.



Fire Safety

Fire-safety requirements help protect passengers, equipment and critical systems. Materials must limit fire risk, while select safety-critical connections must maintain circuit operation during extreme heat to support essential functions.



Sealing Management

Trackside and undercar connections can be exposed to rain, moisture, dust and high-pressure cleaning. Effective sealing is essential to prevent fluid and contaminant ingress, protect electrical interfaces and maintain dependable operation in exposed environments.



High Power

Modern railway systems require reliable transmission of high electrical loads. Solutions must safely manage high current and voltage while maintaining secure connections under vibration, supporting demanding power architectures throughout the vehicle and bogie.



Signal Integrity & EMI

Railway systems increasingly depend on RF and fiber-optic connectivity for communications. Interconnect solutions must preserve signal quality in electrically noisy environments and provide reliable transmission around equipment such as pantographs and onboard control systems.

One Partner. Every Connection.

Railway architectures combine protected onboard electronics, exposed vehicle connections, highly dynamic bogie systems and stationary trackside infrastructure. Each environment requires a different balance of power, signal, data, RF and fiber-optic performance. Radiall offers a broad portfolio of interconnect technologies, allowing engineers to select and combine the right solutions while maintaining consistent quality, reliability and performance.



Heavy Duty Connectors

- CP, PWBS and PWK Power Connectors
- CVB, CVBS and KVBS Circular Connectors
- GM and GMM Modular Connectors
- EVBS-C7 High-Speed Data Connectors
- KVBS EI15 Fire-Resistant Connectors
- Overmolded Brake-System Connections



Optical Cable Assemblies & Optical Connectors

- Physical Contact (PC) and Optical Connectors
- Expanded Beam (EB) Technologies
- Optical Harnesses
- Active Optical Transceiver Modules



RF Cable Assemblies, RF Coaxial Connectors, Antennas & Contactless Connectors

- TNC, BNC, N, SMA, QMA and QN Interfaces
- RF Harnesses and Diconex Jumpers
- Railway Wi-Fi Antennas



Outdoor Connectors & Multipin Aerospace Connectors

- OCTIS™ Weather-Sealed Outdoor I/O
- Multipin Aerospace ARINC

01

RUGGEDIZED RAIL CONNECTORS

- Roof & Undercar
- Pantograph Sensing
- Modular Connectivity for Jumpers
- Intercar Power & Safety

Ruggedized rail connectors support exposed areas of the train, including roof equipment, exterior systems and intercar connections. Located primarily in EN 50467 localization zones 4 and 5, these applications face direct environmental exposure, thermal cycling, mechanical vibration and movement.

Heavy-duty power, signal, data, RF and fiber-optic solutions provide secure connectivity for equipment including pantographs, exterior systems, intercar jumpers and safety-critical circuits.

APPLICATIONS

ROOF & UNDERCAR	
Connecting Exposed Roof & Undercar Power & Signal Systems	CVBS / KVBS Reverse-Bayonet Connectors
PANTOGRAPH SENSING	
Transmitting High-Speed Signals for Real-Time Pantograph Monitoring	GM / GMM Modular Fiber & Data Connectors
MODULAR CONNECTIVITY FOR JUMPERS	
Combining Power, Signal, Data & Optical Links Between Cars	GM Modular Connectors — Power & Signal
	GM Modular Connectors — Data & Optical
INTERCAR POWER & SAFETY	
Transferring High-Current Power Between Adjacent Train Cars	CP Multipole Power Connectors
	PWBS Single-Pole Power Connectors
Maintaining Critical Circuit Continuity During Fire Exposure	KVBS EI15 Fire-Resistant Connectors

→ Roof & Undercar



Connecting Exposed Roof & Undercar Power & Signal Systems



CVBS / KVBS Reverse-Bayonet Connectors

Designed for exposed railway applications, CVBS circular connectors provide rugged signal and power connectivity across a wide range of train exterior equipment.

With 1 to 201 poles and more than 300 insert layouts, the range supports flexible system configurations while reverse-bayonet coupling provides secure connections in high-vibration environments. CVBS solutions achieve EN61373 up to Category 3 axle-vibration resistance.

→ Pantograph Sensing



Transmitting High-Speed Signals for Real-Time Pantograph Monitoring



GM / GMM Modular Fiber & Data Connectors

GM modular circular connectors support fiber-optic and high-speed signal transmission for roof-mounted monitoring systems.

By combining multiple technologies within a rugged housing, GM solutions provide reliable connectivity for real-time pantograph status and other sensing functions while withstanding the vibration and environmental exposure associated with rooftop railway installations.

→ Modular Connectivity for Jumpers



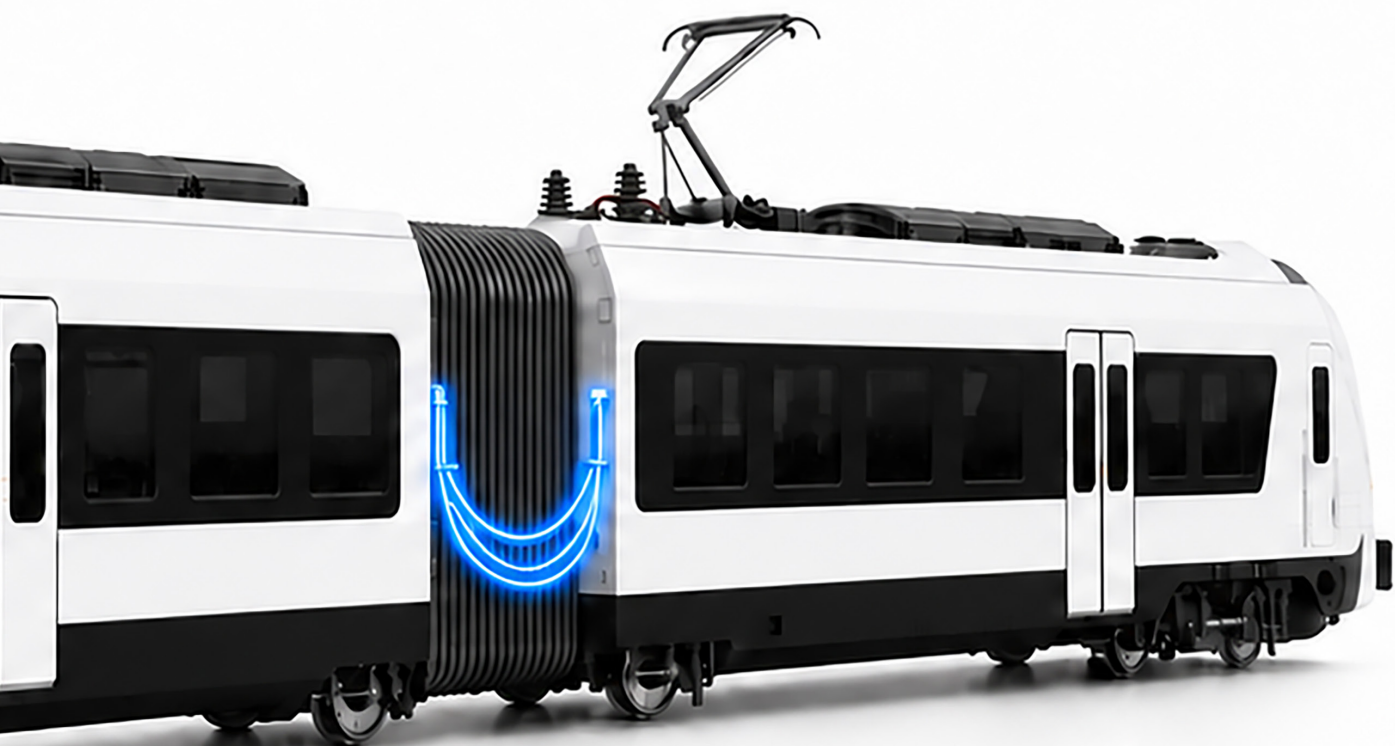
Combining Power, Signal, Data & Optical Links Between Cars



GM Modular Connectors — Power & Signal

GM Series circular connectors provide a modular platform for high-density intercar connectivity. Configurations can incorporate modules ranging from a single 200 A contact to 14 lower-current contacts, allowing power and signal transmission to be combined within one rugged housing.

The modular architecture simplifies integration while supporting the demanding vibration and movement associated with connections between cars.



GM Modular Connectors — Data & Optical

For multi-technology intercar links, GM Series housings can integrate coaxial, Cat 7A Ethernet and optical modules alongside traditional electrical contacts.

Individual module shielding helps minimize internal crosstalk and preserve signal integrity, enabling multiple communication technologies to travel through a single compact interface between adjacent train cars.

→ Intercar Power & Safety

Transferring High-Current Power Between Adjacent Train Cars



CP Multipole Power Connectors

CP rectangular multipole connectors are designed for high-current power transfer between railway vehicles. Available in 2 to 8-pole configurations, CP solutions support currents up to 1,200 A per pole and operating voltages up to 3,600 V.

Their rugged construction provides dependable high-power connectivity for intercar and other demanding railway power applications.



PWBS Single-Pole Power Connectors

PWBS metallic single-pole connectors provide secure high-current power transmission in dynamic railway environments.

Size 32/40 configurations manage loads up to 1,200 A and 3,600 V, while the reverse-bayonet locking system helps prevent accidental uncoupling under vibration. This robust design makes PWBS well-suited for demanding intercar power connections.



Maintaining Critical Circuit Continuity During Fire Exposure



KVBS EI15 Fire-Resistant Connectors

KVBS EI15 stainless-steel circular connectors are designed to maintain electrical continuity in safety-critical railway circuits during fire exposure.

When paired with fire-resistant cables, the solution maintains continuous circuit operation at 740 °C for 15 minutes, helping preserve essential system functions under extreme emergency conditions.



02

ONBOARD SYSTEMS CONNECTORS

- Auxiliary Power, HVAC & Doors
- Driver's Cabin
- Electrical Cabinets & Equipment Racks

Protected onboard areas contain the control, communication, information and power systems required for daily train operation. Located primarily in EN 50467 localization zones 1–3, these applications include driver desks, equipment racks, control cabinets, passenger information systems and battery or converter compartments.

Radiall combines high-speed data, RF, fiber-optic, multipin and power technologies to provide compact, reliable connectivity throughout these protected onboard environments.

APPLICATIONS

AUXILIARY POWER, HVAC & DOORS	
Connecting Train Radios & Onboard Communication Systems	RF Harnesses & Diconex Jumpers
Connecting Batteries, Converters & Onboard Power Distribution	PWK Single-Pole Power Connectors
DRIVER'S CABIN	
Connecting Cab Radio	ARINC 404 Equipment Connectors
Transmitting High-Speed Ethernet Across Onboard Systems	EVBS-C7 High-Speed Data Connectors
ELECTRICAL CABINETS & EQUIPMENT RACKS	
Transmitting High-Bandwidth Optical Data Between Onboard Systems	Physical Contact Optical Connectors
	Expanded Beam Optical Harnesses
Connecting Driver Desks, Electronics & Equipment Racks	CV Rail Rack & Panel Connectors

→ Auxiliary Power, HVAC & Doors



Connecting Train Radios & Onboard Communication Systems



RF Harnesses & Diconex Jumpers

Radial RF harnesses and Diconex jumpers provide reliable coaxial connectivity for train radios and onboard communication systems.

Supporting frequencies up to 6 GHz across 50 Ω and 75 Ω architectures, solutions are available with TNC, BNC, N, SMA, QMA and QN interfaces to support a wide range of railway RF and communications applications.

Connecting Batteries, Converters & Onboard Power Distribution



PWK Single-Pole Power Connectors

PWK thermoplastic single-pole connectors provide high-voltage connectivity for onboard batteries, converters and low-voltage power-distribution equipment.

Rated up to 1,500 V and supporting cable cross-sections up to 185 mm², the rugged design delivers dependable power transmission while meeting EN 45545-2 and NFPA 130 railway fire-safety requirements.

→ Driver's Cabin



Connecting Cab Radio



ARINC 404 Equipment Connectors

ARINC 404-style blind-mate connectors provide reliable multipin connectivity for railway equipment racks and protected electronic systems.

Designed to simplify equipment installation and removal, these rectangular interfaces support high-density signal connections while allowing electronics modules to engage directly with fixed rack-mounted interfaces.

Transmitting High-Speed Ethernet Across Onboard Systems



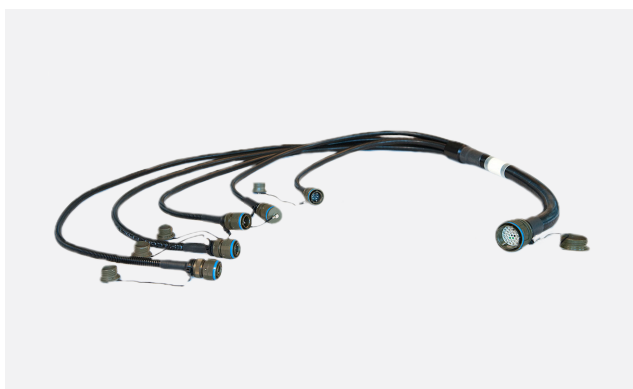
EVBS-C7 High-Speed Data Connectors

EVBS-C7 compact circular bayonet connectors support Category 7A Ethernet transmission up to 1 GHz for demanding onboard data networks.

Designed for protected railway environments, the rugged interface provides reliable high-speed connectivity for passenger information systems, driver displays and train-control equipment while maintaining dependable performance under shock and vibration.

→ Electrical Cabinets & Equipment Racks

Transmitting High-Bandwidth Optical Data Between Onboard Systems



Physical Contact Optical Harnesses

Physical Contact optical harnesses provide high-density fiber connectivity for protected onboard networks where reliable high-bandwidth transmission is essential.

PC and MT-based technologies support compact optical interfaces between train electronics, control systems and equipment racks, helping move large volumes of data while reducing susceptibility to electromagnetic interference.



Expanded Beam Optical Harnesses

Expanded Beam optical technologies provide rugged fiber connectivity where contamination resistance and dependable optical performance are important.

Solutions including EB-LuxCis® and MIL-DTL-38999-based interfaces support reliable onboard data transmission while providing an alternative to conventional physical-contact fiber designs for demanding railway system architectures.

Connecting Driver Desks, Electronics & Equipment Racks



CV Rail Rack & Panel Connectors

CV rail connectors provide compact multipin connectivity for railway racks, panels and electronic cabinets.

Available in 21-, 24-, 37- and 39-contact configurations, the range supports onboard control electronics and equipment installations with mechanically coded, flame-resistant designs.





03

BOGIE CONNECTORS

- Power Distribution
- Braking & Sensing

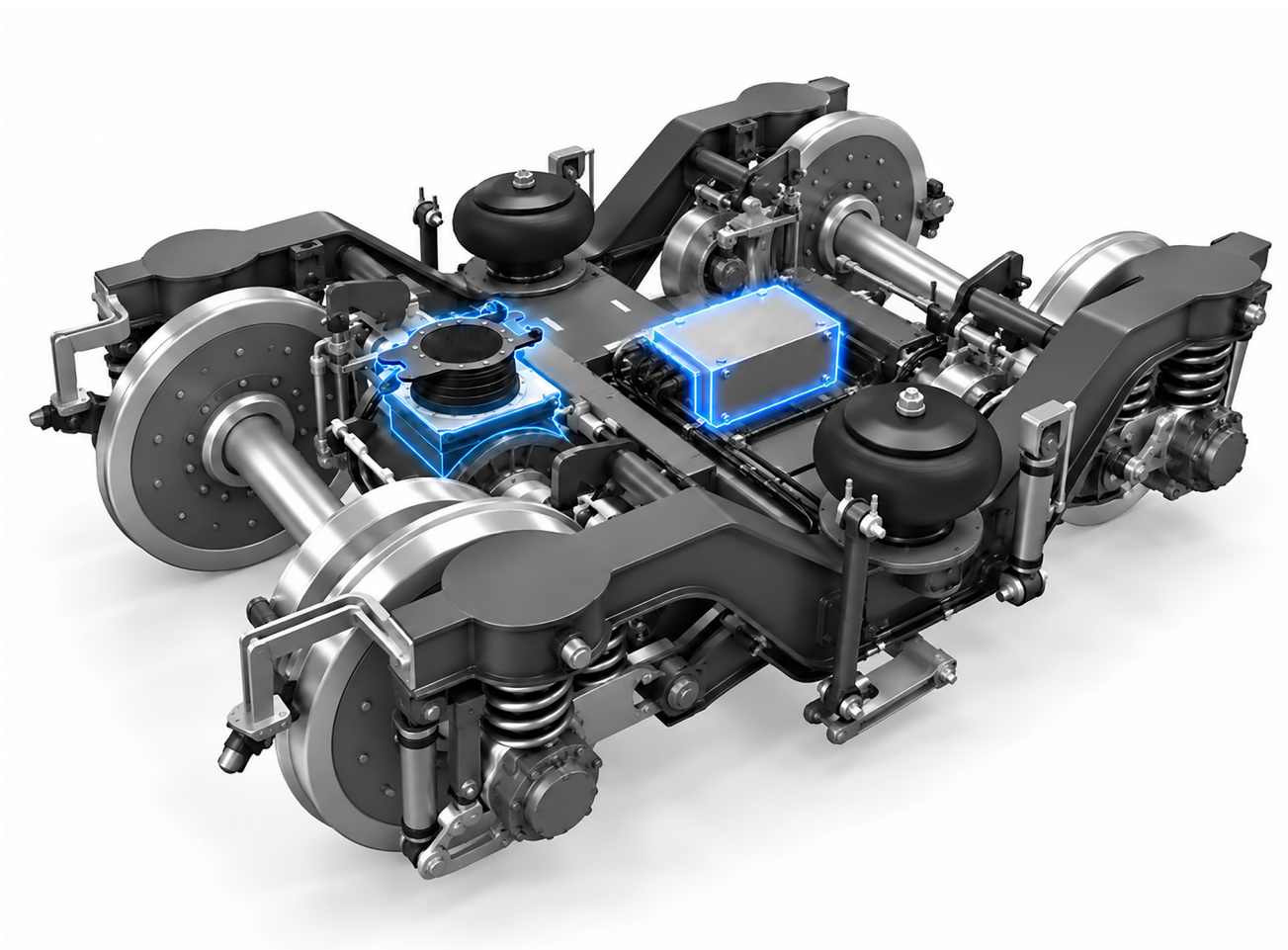
Bogie systems operate in some of the most mechanically demanding areas of the train, where traction, braking, sensing and power distribution are exposed to continuous shock, vibration, contamination and movement.

Located in EN 50467 localization zones 6 and 7, these connections require ruggedized designs that maintain electrical integrity around wheelsets, axles and undercar equipment. Radial heavy-duty power and circular interconnect solutions support traction motor, brake control, distribution and sensor connections.

APPLICATIONS

POWER & DISTRIBUTION	
Delivering High-Current Power to Traction Motors	CP Series Motor Connectors
Transferring Traction Power Between Car Body & Bogie	PWBS Single-Pole Metallic Connectors
	CP Multipole Power Connectors
Centralizing Power Branching & Motor Connections	CP Junction Boxes
BRAKING & SENSING	
Connecting & Sealing Brake-Control Lines Beneath the Train	CV110608 Overmolded Connectors
Connecting Speed, Axle & Brake-Sensing Equipment	Small RF CVB/CVBS Connectors

→ Power Distribution



Delivering High-Current Power to Traction Motors



CP Series Motor Connectors

CP Series rectangular connectors provide high-current multipole connectivity for traction motors and other vehicle power systems.

Designed primarily for 3-pole motor applications, the range supports currents up to 1,200 A per pole and operating voltages up to 3,600 V, providing dependable power transmission in demanding bogie environments.

Transferring Traction Power Between Car Body & Bogie



PWBS Single-Pole Metallic Connectors

PWBS reverse-bayonet connectors provide heavy-duty single-pole power transfer between the vehicle body and bogie.

Supporting traction loads up to 1,200 A and 3,600 V, the metallic connector design uses a secure reverse-bayonet locking mechanism to help prevent uncoupling under the continuous vibration generated beneath the train.



CP Multipole Power Connectors

For applications requiring multiple power contacts within one interface, CP rectangular connectors provide rugged multipole connectivity for 2 to 8-pole configurations between car body and bogie systems.

High-current configurations support demanding traction loads while their robust mechanical construction provides dependable electrical performance in highly dynamic undercar environments.

Centralizing Power Branching & Motor Connections



CP Junction Boxes

CP Junction Boxes provide passive undercar power distribution directly on the bogie frame. Configurations with pre-installed connector sockets centralize power branching and motor connections within a rugged enclosure, simplifying external wiring while providing organized, serviceable interfaces for demanding traction and undercar power architectures.

→ Braking & Sensing

Connecting & Sealing Brake-Control Lines Beneath the Train



CV110608 Overmolded Connectors

CV110608 pre-terminated circular connectors incorporate factory cable overmolding for rugged brake-control connections.

The integrated overmolded strain relief seals the cable entry point against fluid ingress and jet washing, helping protect electrical interfaces and maintain reliable performance in exposed undercar environments.

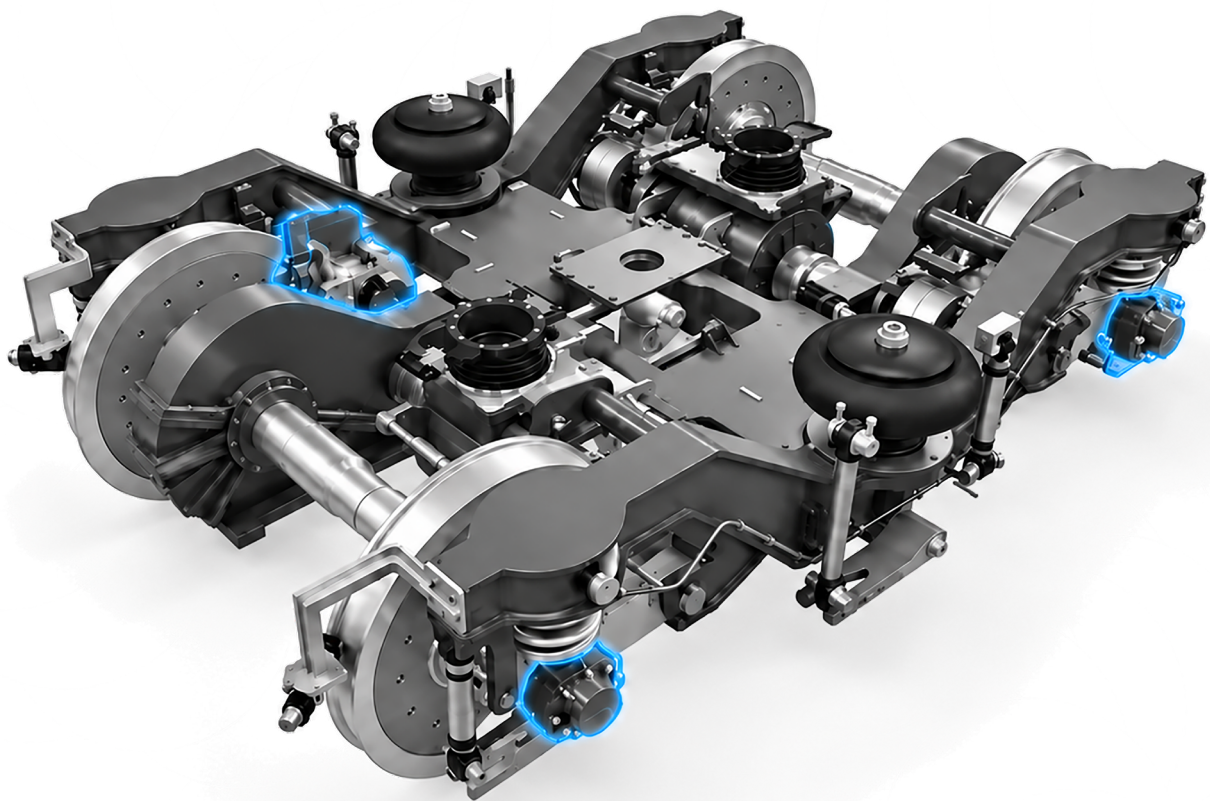
Connecting Speed, Axle & Brake-Sensing Equipment



Small RF CVB / CVBS Connectors

Miniature CVB and CVBS circular bayonet connectors provide compact interfaces for speed sensors, axle monitoring and brake-sensing equipment.

Their small shell dimensions fit restricted spaces around wheelsets and bogie components, while available stainless-steel shell variants help maintain contact alignment and dependable electrical performance under high-G axle vibration.





04

TRACKSIDE & INFRASTRUCTURE CONNECTORS

- Trackside Systems
- Station Cabinets
- Radiofrequency & Wi-Fi Connectivity

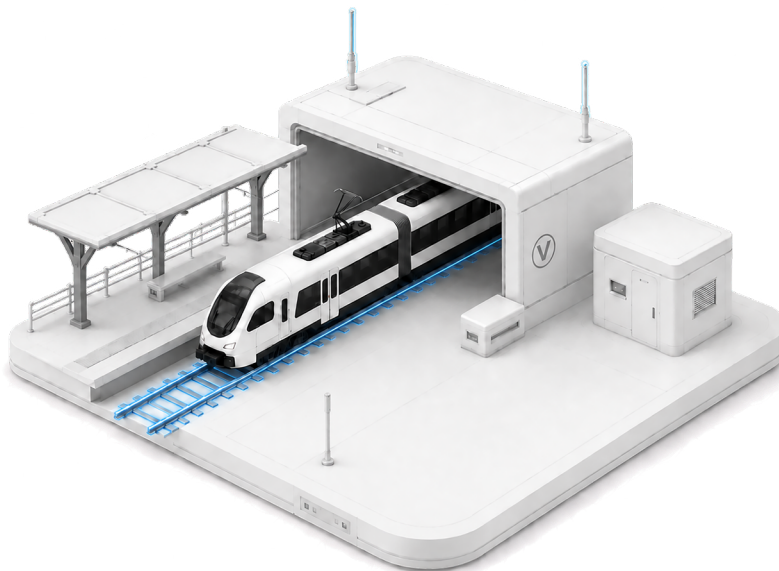
Trackside and infrastructure systems extend reliable connectivity beyond the train to stationary equipment across the railway network. Outside the EN 50467 rolling-stock localization zones, these applications include signaling cabinets, interlocking systems, switch heaters, axle counters, telecom equipment and depot facilities.

Radiall combines rugged circular, multipin, RF, antenna and multi-purpose outdoor solutions to support dependable signal, data, communications and power connections while withstanding weather, moisture, temperature extremes and long-term outdoor exposure.

APPLICATIONS

TRACKSIDE SYSTEMS, STATION CABINETS AND RADIOFREQUENCY & WI-FI CONNECTIVITY	
Connecting Signaling, Switch-Heating & Trackside Equipment	CVB / CVBS Trackside Connectors
Connecting Control Panels & Stationary Signaling Cabinets	MMC Crimp-Contact Connectors
Combining Optical, Ethernet, Coaxial & Power Outdoors	OCTIS™ Multi-Technology Connectivity
Supporting Telemetry, CBTC Signaling & Station Wireless Networks	Dual-Band Railway Wi-Fi Antennas
Supporting RF Links Across Trackside Communications Equipment	RF Coaxial Connectors
	RF Cable Assemblies

→ Trackside Systems, Station Cabinets and Radiofrequency & Wi-Fi Connectivity



Supporting Telemetry, CBTC Signaling & Station Wireless Networks



Dual-Band Railway Wi-Fi Antennas

External railway Wi-Fi antennas support wayside telemetry, CBTC signaling and station wireless networks across 2.4 GHz and 4.9–5.9 GHz frequency bands.

The dual-band architecture provides a single rugged antenna platform for multiple wireless applications, helping simplify communications infrastructure across stations, depots and other railway environments.

Connecting Signaling, Switch-Heating & Stationary Railway Equipment



CVB / CVBS Trackside Connectors

CVBS reverse-bayonet circular connectors provide rugged connectivity for wayside signaling, switch-heating and other stationary railway equipment.

Available with 1 to 201 poles across more than 300 layouts, the range supports a broad selection of signal and power requirements while offering vibration resistance up to EN 61373 Category 3.

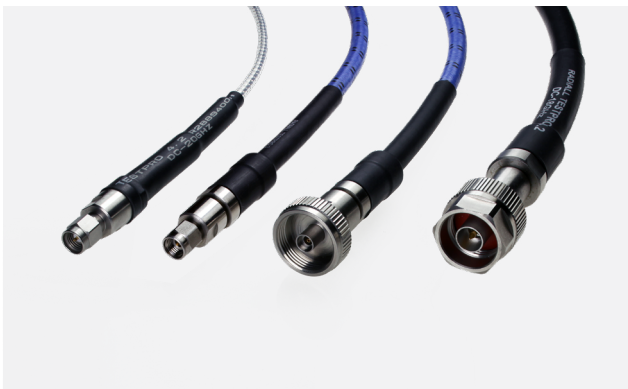
Supporting RF Links Across Trackage Communications Equipment



RF Coaxial Connectors

Radiall RF coaxial connectors support radio links, signaling equipment and communications cabinets throughout trackside infrastructure.

Available in TNC, BNC, N, QMA, QN and SMA interfaces, the portfolio supports frequencies up to 6 GHz with 50 Ω and 75 Ω impedance options for a wide range of railway RF architectures.

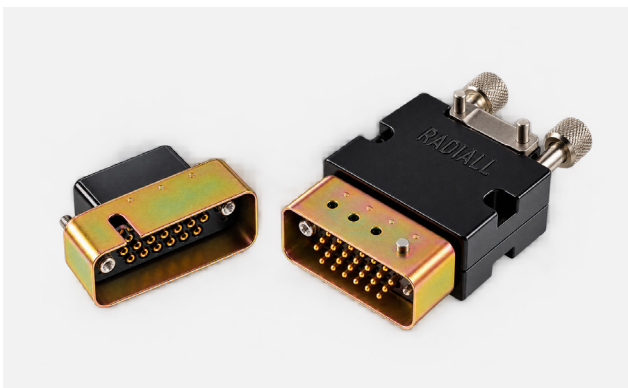


RF Cable Assemblies

RF cable assemblies provide complete coaxial connections between wayside radio, signaling and communications equipment.

Designed around established RF interfaces, these assemblies help preserve dependable signal transmission across stationary railway systems while giving engineers flexibility to connect cabinets, radio equipment and other distributed RF infrastructure.

Connecting Control Panels & Stationary Signaling Cabinets



MMC Crimp-Contact Connectors

MMC rectangular multipin connectors provide organized, high-density connectivity inside stationary control panels and signaling cabinets.

Configurations accept removable crimp or solder contacts to simplify termination and maintenance. Dimensions support consistent integration across stationary railway electrical and control equipment.

Combining Optical, Ethernet, Coaxial & Power Outdoors



OCTIS™ Multi-Technology Connectivity

OCTIS™ provides a modular, weather-sealed outdoor I/O platform for telecom and signaling equipment. Optical, Ethernet, coaxial and power interfaces can be integrated within a common IP68 housing, simplifying trackside architectures while supporting multiple transmission technologies. Its compact, rugged design protects connections against UV exposure, water ingress and extreme temperature cycles for dependable long-term performance in demanding outdoor environments.





One Partner. Every Connection.

Railway systems depend on reliable connectivity across every operating environment, from protected onboard equipment to exposed exterior systems, highly dynamic bogies and trackside infrastructure. As rail networks continue to evolve, Radiall brings together expertise in power, signal, data, RF, fiber optics and multipin technologies to help engineers build safe, reliable and connected railway systems.

SIMPLIFICATION is our INNOVATION

We advance the design and engineering process for innovators, ground breakers and pioneers of technology. We reduce weight, improve durability and streamline installation to provide leading-edge connectors that drive product performance.

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GLOBAL PRESENCE

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