



# HEAVY DUTY CONNECTORS RAILWAY APPLICATIONS

*Booklet*







# ABOUT US

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*Radiall's comprehensive range of connectors is designed for harsh environments in the railway market (rolling stock, signaling and infrastructures). The range includes innovative multisignal I/O solutions for optical, high speed data signals, such as cat. 7, MVB, Ethernet, power or RF coaxial.*



Radiall has been enabling technology and innovation through collaboration with customers since 1952. This has resulted in a range of innovative and award-winning products that customers trust for unrivaled repeatability and performance. Radiall's success is built on strong customer relationships and quality components, which have been established since its foundation.

With a focus on simplification and innovation, Radiall has become an industry leader in providing innovative solutions to customers. From connectors to in-house technologies, Radiall's commitment to collaboration and innovation has made it a trusted partner for customers looking to build the future.



The VanSystem brand in the Radiall world distinguishes "heavy duty" connectors for railways and industrial applications. The name origin is related to VanSystem, an Italian company founded in Milan in 1985 and specialized in the design and production of industrial connectors.

Over the last 30 years of operations, the company has gained a strong market position by developing interconnection solutions compliant with the SAE AS 50151 (ex MIL-DTL-5015) standard and tailor-made connectors for the railway, machine tools, automation, construction sites, power supply and extractive markets. In 2015 Radiall SA took over the company; Radiall Italia was born in 2021, from the merger between VanSystem srl and Radiall Elettronica srl. Radiall Italia S.r.l. Quality System is qualified according ISO 9001:2015 and ISO/TS 22163:2017 (IRIS).





# INTERNATIONAL STANDARD

*Radiall Italia products are developed according to the following standards.<sup>[1]</sup>*

- EN 50467: Railway applications - Rolling stock electrical connectors, requirements and test methods
- IEC 62847: Railway applications - Rolling stock, electrical connectors, requirements and test methods
- SAE AS 50151 (ex MIL-DTL-5015): Circular threaded electrical connectors with solder or removable crimp contacts (both front and rear release)
- VG 95234: Electrical connectors and plug-and-socket devices, connectors with coupling pressure-water tight, up to 245A
- EN 61373: Railway applications - Rolling stock equipment - Shock and vibration tests
- EN 60077-1: Railway applications - Electric equipment for rolling stock - General service conditions and general rules
- EN 50124-1: Railway applications - Insulation coordination
- EN 45545-2: Railway applications - Fire protection on railway vehicles
- EN 45545-3: Railway applications - Fire Resistance requirements for fire barriers.
- EN 50125-1: Railway applications - Environmental conditions for equipment Rolling stock and on-board equipment
- NFPA 130 (ASTME 162, ASTME 662): Standard for Fixed Guideway Transit and Passenger Rail Systems
- NFF 61-030: Railway rolling stock electrical connectors - Generalities (KVBS series)
- IEC 60529: Degrees of protection provided by enclosures (IP Code)
- European Directive 2011/65UE: RoHS

1. According to the products series, please consult our Sales office

| *We tailor solutions to suit your needs.*

### CIRCULAR CONNECTORS

Radiall Italia designs and produces circular connectors for harsh environments. This series, deriving from SAE AS 50151 (ex MIL-DTL-5015) and VG95234 specs, has become a popular standard among railway connection applications. Its success is mainly due to the bayonet coupling system composed of three ramps machined on the external side of the receptacle connector and three stainless steel studs mounted inside the plug connector's coupling nut.

### MODULAR CONNECTORS

GM modular connectors are designed for accepting modules for many different applications: Ethernet and data transmission, coaxial connections, fiber optics, power cables and signals up to 14 wires. It is a flexible solution for data and signal transmissions in harsh railway environments. It can be used for passenger control, display, internet connection, networking, light control, diagnostic support for brakes, motors and doors.

### DATA CONNECTORS

Radiall Italia completes its product range with data connectors cat. 7A / 7 / 6A. EVBS-C7 bayonet connector for Ethernet cat. 7A is vibration and shock resistant. EVBS-C7 is the definitive alternative for Ethernet static interconnections inside railway vehicles. Standard EVBS connectors can be applied in sensors and Ethernet connection cat. 6 / 5E.

### POWER CONNECTORS

Besides connectors with screw or bayonet coupling, Radiall Italia develops non-standard products for special applications (Railways, Atex Environment and Automation). PWBS single-pole bayonet connector (size 40 or 32 shells) has been developed for motor connection in railway applications up to 1000A. CP rectangular power connectors have 3, 4 or 5 poles, and are ideal for motor-to-vehicle connections in railway applications.

### MULTIPIN CONNECTORS

Radiall is a global leader in designing and manufacturing high reliability multipin connectors for transportation applications. For more than 40 years, major airframers have trusted Radiall's NSX (Arinc 600) and DSX (Arinc 404) rack and panel connector series, along with its modular solutions such as the EPX™ (EN4644), QuickFusio™ and QM series.

### OUTDOOR CONNECTORS

Radiall's comprehensive product range of outdoor connectors are designed for severe outdoor conditions, mainly in wireless communication infrastructure applications. The range includes high power RF coaxial connectors to link between microwaves, antennas, radio units, and innovative multisignal I/O solutions for optical, Ethernet, power or coaxial. Our innovative solutions are based on both Physical Contact (PC) and Expanded Beam (EB) technologies to cover the various types of applications.





## SIGNAL & POWER



### BOGIES, AXLE, ENGINES

*Power installation, highly dynamic applications*

#### **Product Solutions**

*CP Power Connectors*

*CP Junction boxes*

*PW3 and PWBS series*



**PROTECTED ELECTRICAL AREA**

*Driver cabin, windscreen wipers, lights*

**Product Solutions**

*Rack and Panel Connectors  
RF CVBS and KVBS Connectors*



**TRACKS**

*Train checkpoint, interlocking, signaling, trackside safety systems, switch heaters*

**Product Solutions**

*CVBS and CVBSG Bayonet Connectors*



**INFRASTRUCTURES**

*Signaling, communications cabinet*

**Product Solutions**

*CVB and CVBS Bayonet connectors*



**TRAIN CONTROL**

*Security systems, control cabinets, engine monitoring*

**Product Solutions**

*KVBS, RF CVBS Bayonet Connectors*

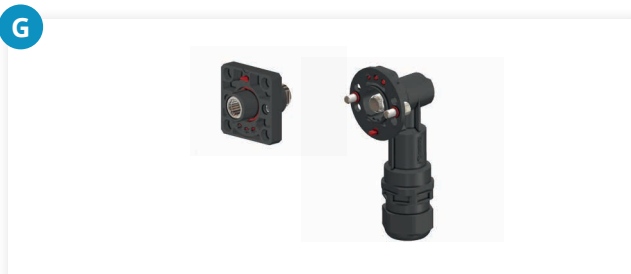


**OUTDOOR APPLICATIONS**

*Roof, pantograph, air conditioning system*

**Product Solutions**

*PWBS Power Connectors  
KVBS, RF CVBS and CVBSG Bayonet Connectors*



**UNDERCAR**

*Battery chargers, auxiliary converters, inverters, brake control systems*

**Product Solutions**

*PWK and PWBS Power Connectors  
GVJ Oversize Connectors  
KVBS, RF CVBS Bayonet Connectors*



**INTERVEHICLE**

*Wagon connection, door controls, passenger information, outdoor dynamic applications*

**Product Solutions**

*GM Modular Connectors  
KVBS, RF CVBS Bayonet Connectors*





# DATA TRANSMISSION



## OUTDOOR APPLICATIONS

Controlling pantograph, air conditioning system, internal train bus (MVB)

### Product Solutions

GM Modular Connectors



## DATA COMMUNICATION

Passenger information and entertainment system, control unit with Ethernet

### Product Solutions

EVBS Data Connectors up to cat. 7A





**INTERVEHICLE**

Wagon connection, door controls, passenger information, outdoor dynamic applications

**Product Solutions**

GM Modular Connectors



**BOGIES, AXLE, ENGINES**

Measurement and sensor system

**Product Solutions**

Stainless Steel RF CVB, CVBS and KVBS Series



**TRAIN CONTROL**

Security systems, control cabinets, engine monitoring, video and other data transmission

**Product Solutions**

EVBS Bayonet Connectors



**PROTECTED ELECTRICAL AREA**

Driver desk control, current converter, electrical cabinet, low voltage supply and digital signals

**Product Solutions**

KVBS and RF CVBS Bayonet Connectors  
Rack and Panel Connectors



**UNDERCAR**

Brake control systems, speed sensor, sub-floor distribution box

**Product Solutions**

RF CVBS, RF CVBSG, KVBS Bayonet Connectors

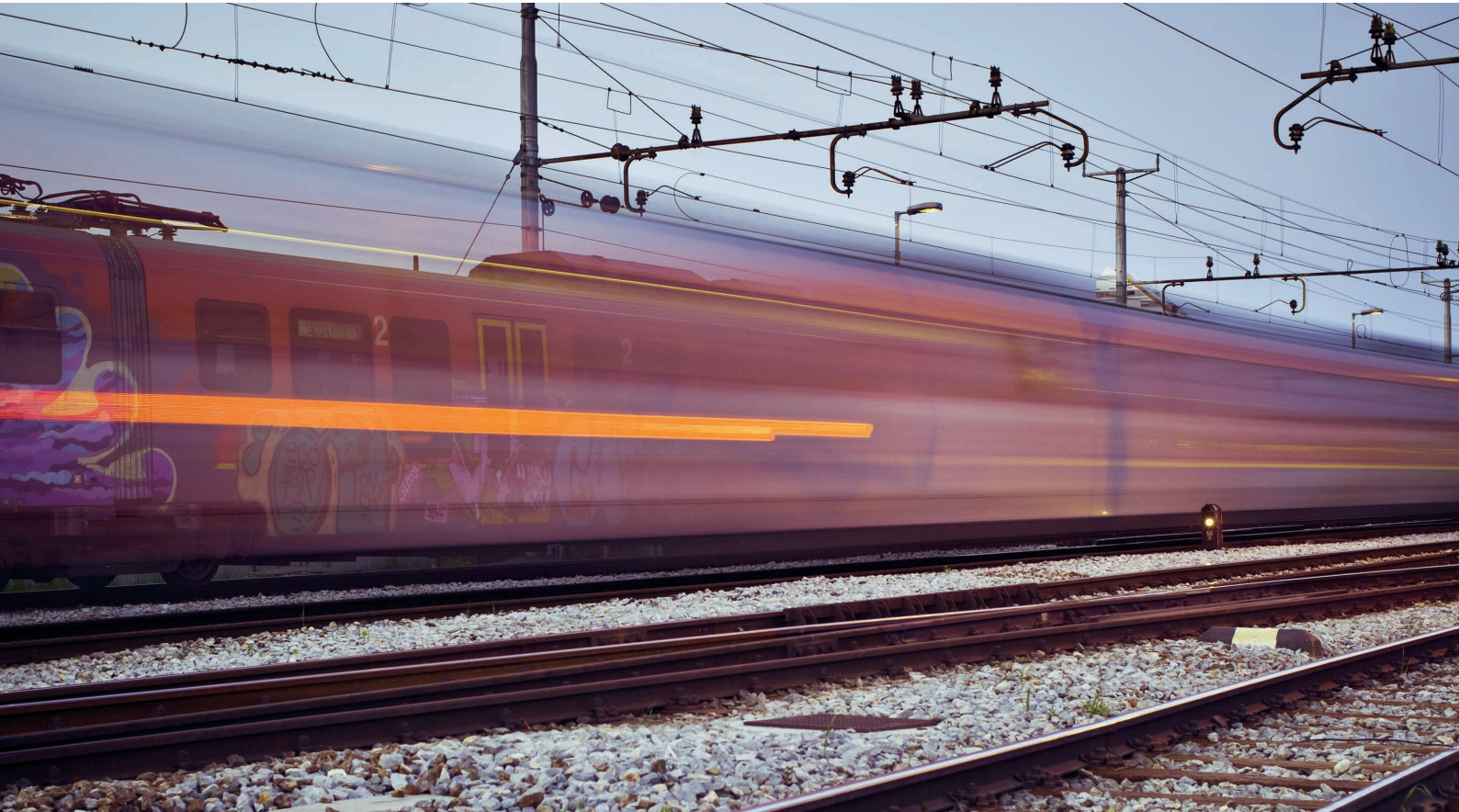


**TRACKS**

Axle counter system

**Product Solutions**

CVBSG AND CVBS Connectors



# SIGNAL & DATA

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## SIGNALLING

*Security systems, control cabinets*

### **Product Solutions**

*I/O RUGGEDIZED INTERCONNECT: OCTIS™, Quick Install, QuickFusio, RXF, QuickMate, MMC*



## HIGH SPEED DATA & RADIO COMMUNICATION

*Passenger information and entertainment system, control unit with Ethernet*

### **Product Solutions**

*RXF/EB-Luxis/38999, QuickFusio FO, Octis, RF coaxial cable assemblies*





**INFRASTRUCTURES**

*Product Solutions*

*Outdoor FO cable assemblies and RF coaxial cable assemblies, OCTIS, Quick Install, QuickFusio, RXF*



**FIBER OPTICS**

*Product Solutions*

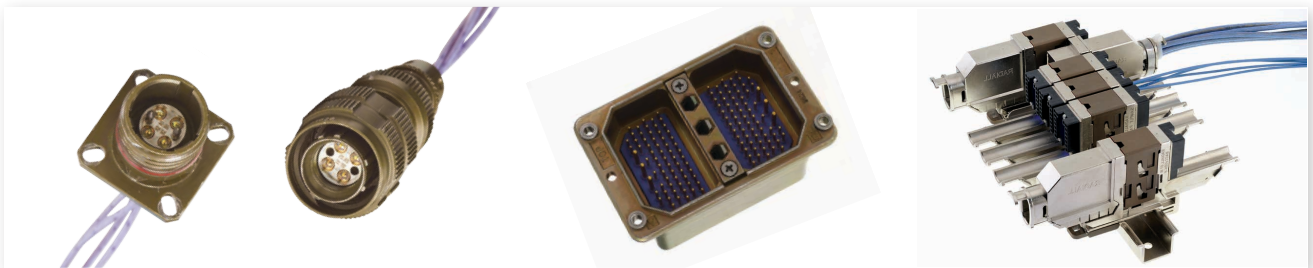
*EB-Luxis/38999, QuickFusio FO, Octis*



**RACK & PANEL SOLUTION PROTECTED ELECTRICAL AREA**

*Product Solutions*

*Arinc 404, Quick Install, QuickFusio, MMC*



**ELECTRICAL CABINET**

*Product Solutions*

*Arinc 404, MMC, Quick Install, QuickFusio, QMATE*



# HEAVY DUTY CONNECTORS

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Visit [www.radiall.com](http://www.radiall.com) for more information



SIMPLIFICATION IS OUR INNOVATION





**RF CVBS & RF CVBSG SERIES**

The success of CVBS series is mainly due to the bayonet coupling system composed of three ramps machined on the external side of the receptacle connector and three stainless steel studs mounted inside the plug connector's coupling nut.



**RF GVJ SERIES**

RF GVJ series has completed the bayonet range with oversized, thicker shells to guarantee resistance against impact and harsh environments. The increased dimension permits installing insulators with more contacts or larger contacts.



**KVBS SERIES**

Compliant with NFF-61030, the new bayonet KVBS series is derived from the standard CVBS. In this new series, the insert is in hermoplastic resin. The most important advantages are the simpler and faster cable assembly; when mated, it guarantees a better sealing and creepage distance between the contacts.



**EVBS SERIES**

EVBS connectors have been developed for sensors and Ethernet connections cat. 6 / 5E. This series, derived from modular series, is vibration and shock resistant as required in transportation applications.



**EVBS-C7 SERIES**

Radiall Italia completes their product range with data connectors cat. 7A / 7 / 6A. EVBS-C7 bayonet connector for Ethernet cat. 7A is vibration and shock resistant.



**PWBS 1000A SERIES**

PWBS single-pole bayonet connector (size 40 or 32 shells) has been developed for motor connections in railway applications up to 1000A.



**CP POWER-BOX SERIES**

CP Power Box has been developed for motor connection in railway applications. Derivation and connection are the most important features.



**CP MOTOR TO BOGIE SERIES**

CP rectangular power connectors with 3, 4 or 5 poles have been studied for motor-to-vehicle connections in railway applications.



**PW3 1000A SERIES**

PW3 rectangular connector are designed for demanding EMI environments and /or lightweight modular approach. Consult our sales offices for details.





# HEAVY DUTY CONNECTORS CONTINUED

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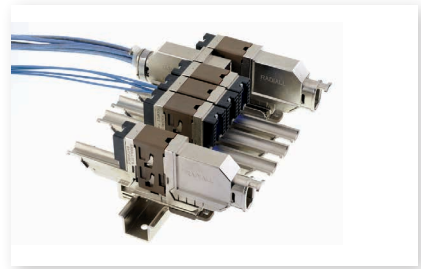
**GM SERIES**

GM modular connectors are designed for accepting modules for many different applications: Ethernet and data transmission, coaxial connections, fiber optics, power cables and signals up to 14 wires.



**H-LEVER SERIES**

H-LEVER connectors are derived from GM modular connector, PWBS single-pole power connector and CVB standard circular connector. H-LEVER joins the advantages of Radiall Italia circular connectors with a lever that is easy to open and close.



**QUICKMATE SERIES**

To simplify wiring in cable-to-cable or PCB-to-cable applications, Radiall developed a range of quick mating connectors with a unique slide lock system. Quick installation systems and simplified termination features will simplify connector installation.



**QUICK INSTALL SERIES**

Designed for through-panel mounting disconnect for harsh environments, Quick Install has many functions in a single piece. Four ramps reduce mating effort and create a "gearing down" function. It also features a low friction coefficient, various insert types and screw washers for the fixing process.



**RXF SERIES**

Dedicated to outdoor optical connections, RXF is designed and manufactured by Radiall to provide a secure and sealed connection. RXF connectors are available in 2, 4 and 6 channels, in MultiMode or SingleMode UPC versions.



**OCTIS™ SERIES**

Specifically designed to address the interconnect challenges associated with the deployment of 4G+, LTE+ and future 5G in the Telecom market, OCTIS™ provides a robust I/O solution that can operate in outdoor and harsh environments.



**EXPANDED BEAM SERIES**

Radiall offers a wide range of interconnect solutions based on Expanded Beam (EB) technology. The advantages of EB technology will enable communication links that are reliable, easy to deploy and easy to maintain.



**FIBER OPTIC CABLE ASSEMBLIES**

Radiall offers high performance and cost-effective cable assemblies for outdoor environments. Outdoor cable assemblies can sustain unstable environmental conditions and broad operating temperature ranges, energy distribution networks, smart grids and security and industrial applications.



**QUICKFUSIO™ SERIES**

QuickFusio™'s versatile range covers any wiring system: harness to harness or equipment to harness. The range offers four different shell styles that allow you to install the miniature connector in panel mount, box mount, bundle mount or structure mount configurations.



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**2023 EDITION**

Rev\_07.2023

050.R009

PRINTED IN ITALY