Train & Subway

Wireless communication solutions for connected mobility (train-to-track, car-to-car & onboard applications)

IRIS® Certification

ACKSYS COMMUNICATIONS & SYSTEMS

Train & Subway

TRAIN-TO-TRACKSIDE COMMUNICATIONS

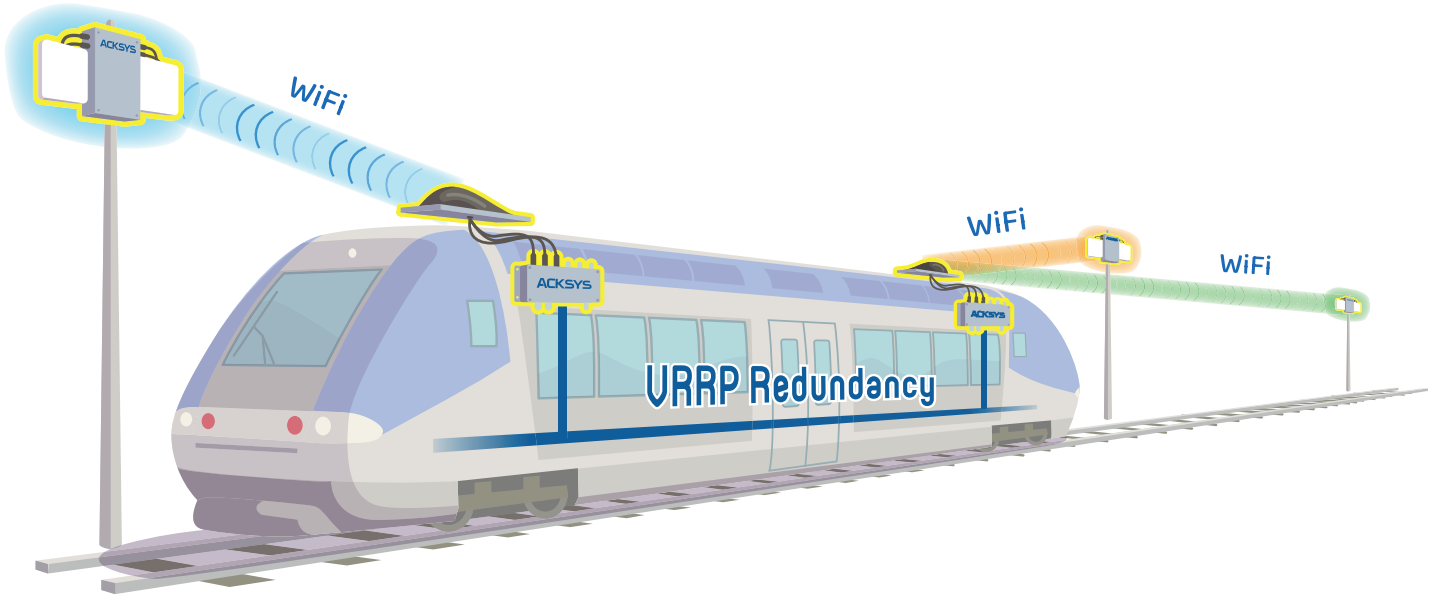
One of the major concerns of rail operators is to establish a high-speed, reliable and continuous communication between a train in motion and the trackside for a smooth CBTC operation and also to collect data from CCTV, preventive maintenance, VoIP, PIS, etc. and retrieve real-time information of these data streams.

> THESE APPLICATIONS REQUIRE HIGHLY-AVAILABLE NETWORKS.

ACKSYS' latest products combining WiFi 6, WiFi 6E and cellular connectivity enable a truly uninterrupted communication to be established with a seamless data flow between the on-board equipment and the trackside.

ACKSYS' unique CBB: Connect Before Break feature allows:

- a 0ms roaming between APs allowing error-free communications
- up to 500 Mbps high-speed data throughput at 350 km/h
- a redundant train-to-ground wireless link allowing a continuous communication even in case of failure of one trackside AP or one onboard client



Application highlights

> MULTIPLE REDUNDANT MECHANISMS

- Redundant train-to-ground communication, automatic assignment of front or rear radio (VRRP)
- Onboard : dual radio APs / Trackside : triple radio APs
- Hardware redundancy (WiFi, Ethernet, power supply)

> 500 MBPS DATA THROUGHPUT AT 350 KM/H

- Connect before break technology
- Packet error rate (PER) < 0.1%

> LTE/ 4G/ 5G

- GNSS

> EASY MAINTENANCE

- Configuration stored on a removable key

> DIRECT CONNECTION TO TRAIN POWER SUPPLY

- 24-110 VDC insulated dual input power supply

> NETWORK EFFICIENCY AND SAFETY

- VLANs, tunnels, firewall, SNMP V3
- Radius authentication, Rogue AP detection, WP2/WPA3

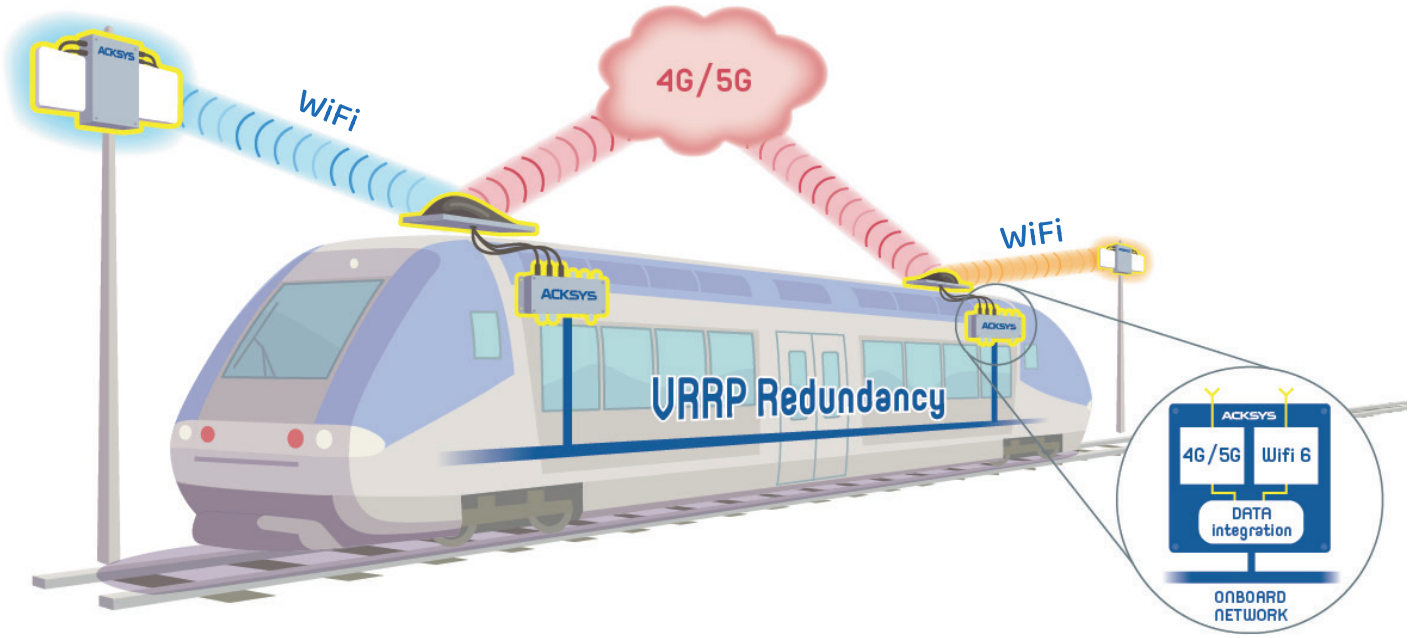
> RAILWAY HARDENED

- IP66
- WiFi : EN 300 328 (2.4 GHz), EN 301 893 (5 GHz, DFS) / LTE : EN 301 908 [-1, -2, -13], EN 301 511, EN 303 413
- EMC : WiFi : EN 301 489 [-1], [-17] / LTE : EN 301 489 [-19], [-52] / Railway : EN 50155, EN 50121-3.2
- Safety : EN45545-2 (HL3), NF F16-101 (M1F1) (Fire and Smoke), EN60950-1, EN62311
- Environmental : EN61373 (shock & vibration), EN60068 (climatic)

> WAVEMANAGER

- Configuration, monitoring, troubleshooting and deployments

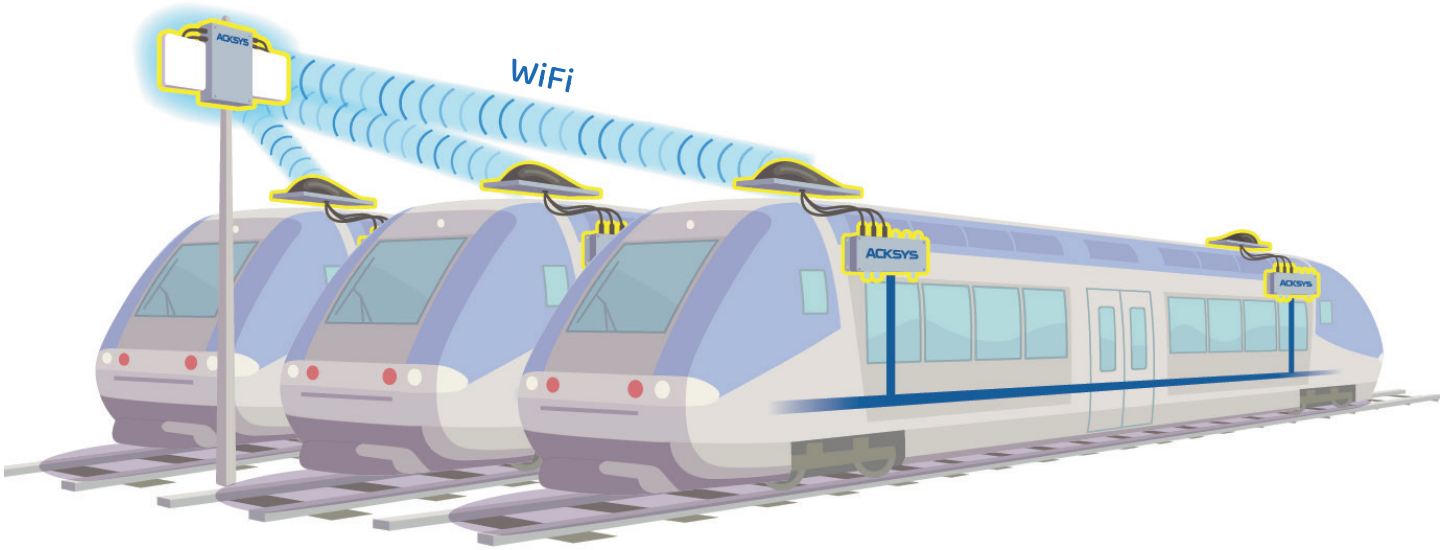
TRAIN-TO-TRACKSIDE COMMUNICATIONS WIFI <>4G/5G SWITCHOVER



HIGH SPEED DATA TRANSFER

To enable a reliable and simultaneous transfer of all the data coming from the various embedded equipment, ACKSYS' solution offers advanced security functions (firewall, VPN, radius, WIDS...) and streams mutualization functions (routing, filtering, VLAN, QoS...).

> ACKSYS RANGE OF RUGGED WiFi/4G ROUTERS ALLOWS A RAPID AND AUTOMATIC TRANSFER OF ALL THE DATA.



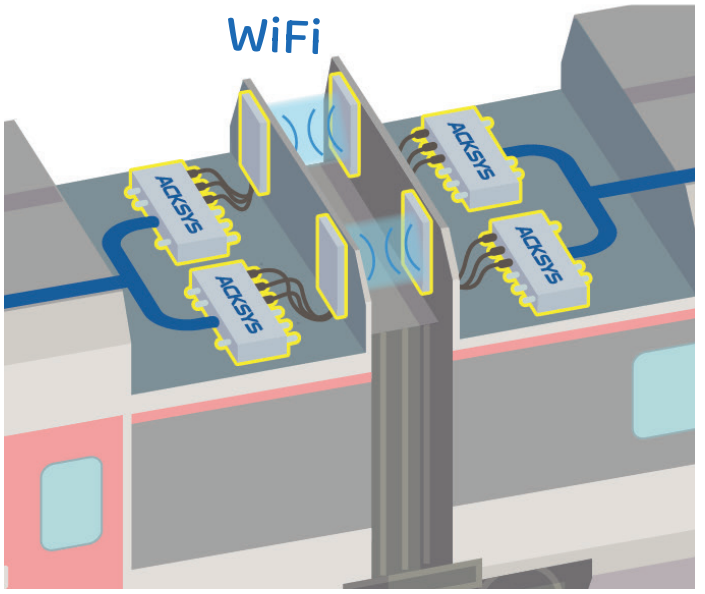
CAR-TO-CAR COUPLING SYSTEM

WiFi has naturally established itself as the most efficient solution by allowing redundancy, reliability and high-speed networking.

ACKSYS' SRCC solution relies on wireless couplers allowing :

- supports any train composition change
- provides a redundant and reliable onboard network

It fulfills any application requirements : CBTC, CCTV, PIS, passengers WiFi access...



SRCC is also available in non-redundant version with only 2 products by car.

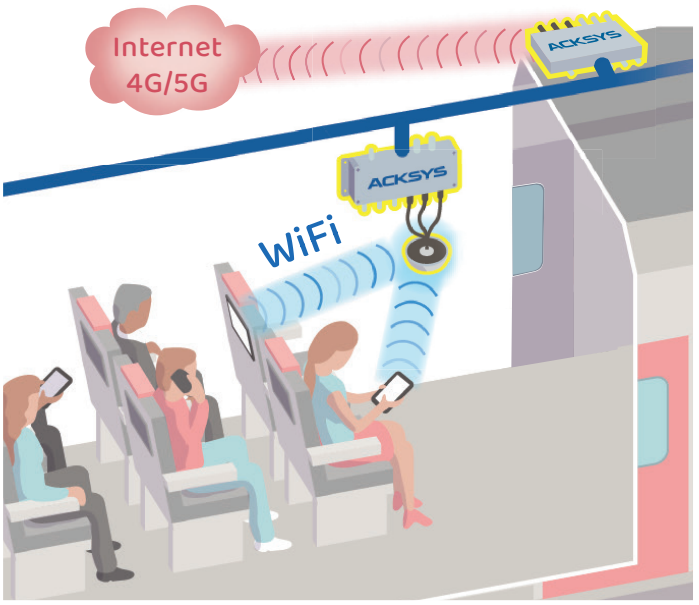
IN-CAR WIFI COVERAGE WIFI AP

ACKSYS offers WiFi devices allowing a seamless in-car coverage through an easy deployment.

The complete solution enable the management of multiple networks dedicated to passenger WiFi, train announcements, PIS, CCTV, VoIP, infotainment...

RailBox is able to increasing the number of users connected, the connection speed and providing an enhanced WiFi experience.

ACKSYS relies on its partners for multi-cellular routers (passengers WiFi).



Application highlights

> SMART REDUNDANT CARRIAGE COUPLING (SRCC)

- Redundant onboard network with 2 WiFi couplers at both ends of each carriage
- Self-forming network : automatic carriage association in any order
- Smart pairing system preventing interconnection with neighboring train networks

> DUAL RADIO DEVICES

- One RF for carriage coupling and the other one for in-car WiFi coverage

ADVANCED AP FEATURES

Load Balancing, Band Steering, Passpoint/Hotspot 2.0

> SEAMLESS & SECURE CAR COVERAGE

- Passengers network separated from service network (VLAN, QoS/WMM, tunnel)
- Dual WiFi for simultaneous 2.4/5 GHz operation
- Maximum 512 clients per radio.
- High-speed 802.11ax
- WPA2/WPA3, 802.11i, 802.1x (radius authentication)
- Load balancing,
- Band steering,
- Client Roaming Control,
- Association Control Per SSID.

> SEAMLESS DEPLOYMENT

- Dual radio architecture allows using the same product for in-car AP and carriage coupler (SRCC)
- Bypass relay option for «Daisy Chain» Ethernet topologies.

Railway WiFi access points & cellular routers

EN 50155	 RailBox	 RuggedAir	 RailTrack
Function	Cellular router or dual WiFi access point	WiFi access point, client, repeater	WiFi access point & backbone repeater
Recommended for	Trackside & onboard	Onboard	Trackside & Tunnel infrastructures
WiFi interface	Single or dual radio WiFi 5: 2.4 / 5 GHz WiFi 6: 2.4 / 5 GHz WiFi 6E: 6 GHz Mu-MIMO 4T4R	802.11ac WiFi 5 2.4 / 5 GHz	WiFi 4 WiFi 5 2.4 / 5 GHz
Cellular interface	Dual SIM 3G / 4G LTE*/ 5G Multi-constellation GNSS	-	-
Maximum number of concurrent users in AP mode	250 per radio (number of clients recommended for an optimal WiFi experience: 120 per radio)	125 per radio (number of clients recommended for an optimal WiFi experience: 40 per radio)	N/A
TECHNICAL CHARACTERISTICS			
Ethernet interface	1 x 10/100/1000/2500 M12	2 x 10/100/1000 M12	2 x 10/100/1000 (M12) 2 x fiber (SFP cage) PoE+ PSE injector
I/O	1 isolated input 1 isolated output		
Dimensions (mm)	80 x 175 x 57	80 x 175 x 57	305 x 200 x 75
Power supply	Dual input - Isolated 24 to 110 VDC - PoE +	Dual input - Isolated 9 to 48 VDC - PoE	Isolated 110 to 230 VAC (50 / 60 Hz)
Operating temperature **Certifications** **IP rating**	Extended: -40°C to +70°, +85°C for 10 mn EN 50155 - class TX IP 66		
FUNCTIONALITIES			
Roaming	0 ms	< 30 ms	N/A
Mesh (802.11s)	✓	✓	✓
Security	Firewall, https, MAC filtering, WPA2/WPA3-Personal & Enterprise (IEEE 802.1X/RADIUS), DoS, tunnels L2 (GRE), VPN (OpenVPN), SNMP V3, WIDS, Rogue AP detection		
Ethernet networking	Frames filtering, bridging, repeater, STP/RSTP, VLAN, DHCP (server & client), DNS relay		
Ethernet routing	Multicast (PIM), IP redundancy (VRRP), static routes, NAT router, router		
Carriage coupling / SRCC	✓	✓	N/A
Administration	http, https, SNMP agent (V1, V2C, V3), WaveManager administration software		
Bypass relay option (Daisy Chain Ethernet topologies)	✓	-	✓
C-Key**	✓	✓	✓

* Optional 2nd radio interface (WiFi or cellular) ** Hardened memory key (configuration backup)

Why choose ACKSYS ?

> RELIABILITY AND ROBUSTNESS

ACKSYS' products are designed to be used in harsh environment, this is why their manufacturing components are carefully selected, controlled and submitted to endurance tests. They come with a 5-year or lifetime warranty.

> LONG LASTING PRODUCTS

In order to provide long lasting solutions to its customers, ACKSYS works closely with its suppliers to foresee any eventual obsolete products and thus back-up its product line to avoid any stock rupture. ACKSYS also pays attention to develop products compatible with existing solutions.

> RELEVANT SOLUTIONS

ACKSYS develops tailored solutions designed to fit its customers' specific business needs or unique application environment and is also able to adapt its products upon request. All ACKSYS' products are compliant with the standards in the various targeted markets..

> CUSTOMER SERVICE COMMITMENT

ACKSYS has developed a solid pre-sales and after-sales process to ensure that customers receive the highest level of support at every stage of their projects. ACKSYS is committed to provide state-of-the-art technology, products and training to keep its customers, distributors and VARs in the forefront of the communication age.

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Since 1984, ACKSYS Communications & Systems has acquired a strong know-how in designing and manufacturing industrial data communication solutions (WiFi and cellular).

Its expertise and high quality standards allows it to meet the most severe requirements in transportation (rail & road), industrial (M2M, IIoT, automation), military (marine, land, air), aeronautics, mining (underground and above ground), oil & gas and environment (renewable energy, water, waste water).

Its inbuilt engineering, technical and commercial teams are able to meet accurately the expectations of its customers and assist them from the definition of their needs to the deployment.Thanks to a qualified and structured distribution network, ACKSYS is present on the five continents and can therefore respond to any industrial application need, any time.

ACKSYS_BR_Train_Subway_US_Rev A4_30/08/2022

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