Train & Subway

Wireless communication solutions for connected mobility (on-ground, car-to-car and on-board applications)

ACKSYS
COMMUNICATIONS & SYSTEMS

Train & Subway

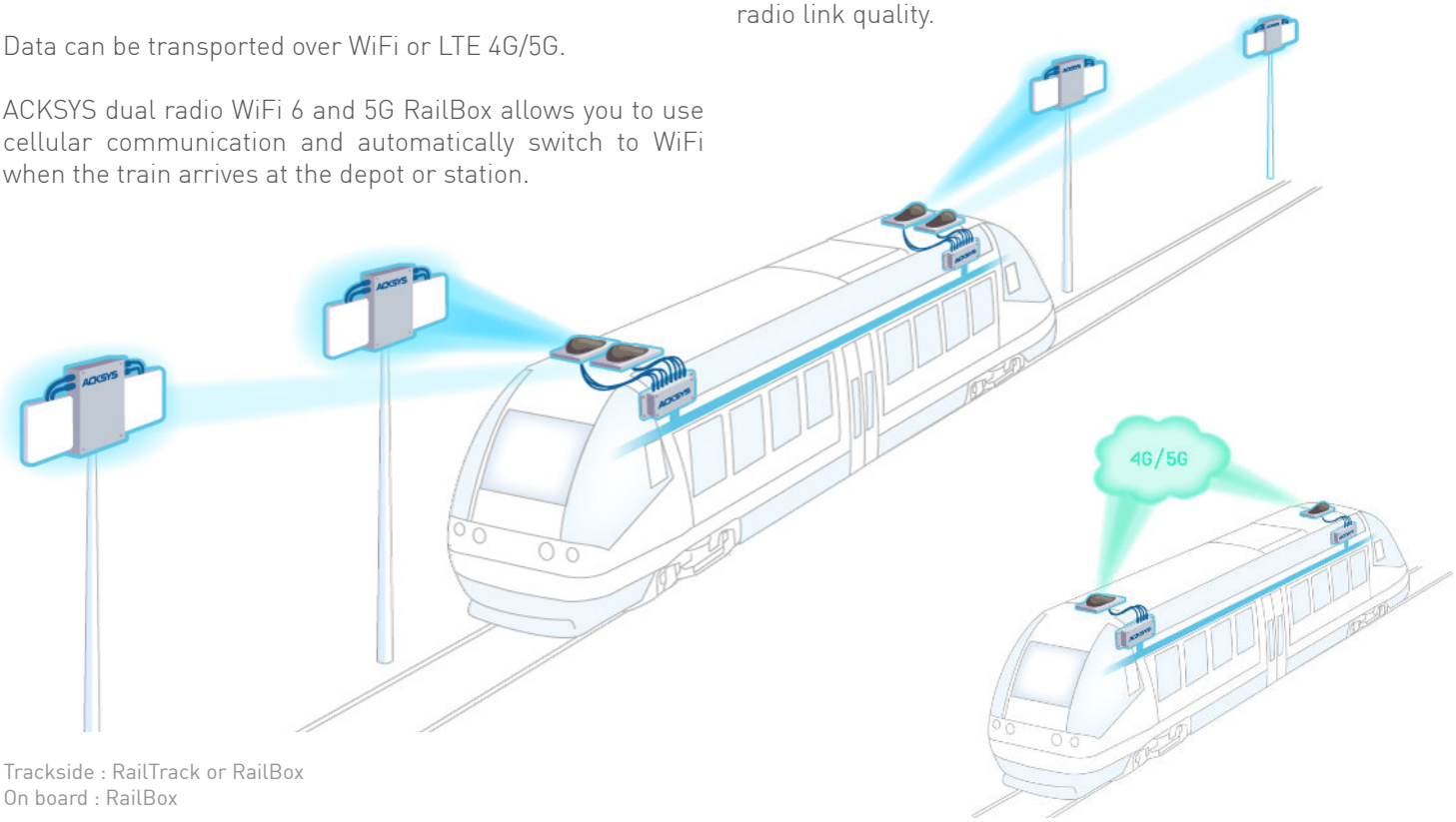
WIFI OR LTE 4G/5G TRAIN TO GROUND COMMUNICATIONS

ACKSYS products enable high-speed, reliable and continuous communication to be established between a moving train and the ground, in order to collect and process real-time data flows for video surveillance (CCTV), preventive maintenance, VoIP, passenger information system (PIS), and more.

Data can be transported over WiFi or LTE 4G/5G.

ACKSYS dual radio WiFi 6 and 5G RailBox allows you to use cellular communication and automatically switch to WiFi when the train arrives at the depot or station.

For WiFi train-to-ground communication, ACKSYS has developed a unique feature, CBB (Connect Before Break) with 0 ms roaming between access points and no loss of packets. This feature has been tried and tested on several metro lines, delivering excellent performance in terms of throughput and radio link quality.

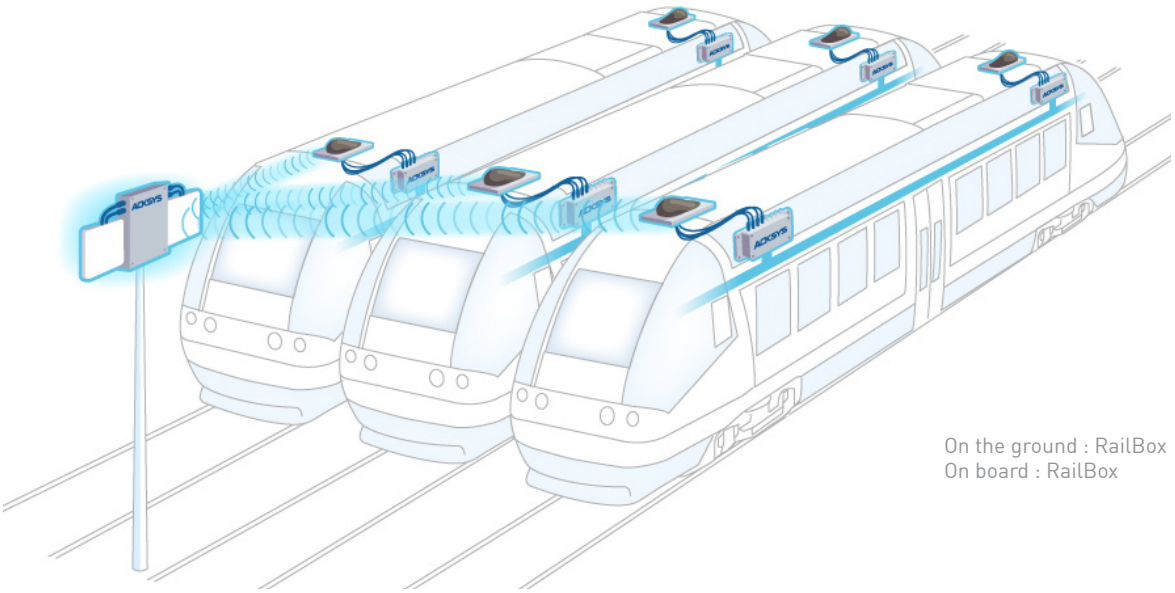


Trackside : RailTrack or RailBox
On board : RailBox

HIGH-SPEED DATA DOWNLOAD AT DEPOT OR STATION

The ACKSYS solution offers advanced security features (firewall, VPN, radius, WIDS, etc.) and flow pooling (routing, filtering, VLAN, QoS, etc.) to ensure reliable and simultaneous transfer of all data from the various on-board devices.

Installed onboard trains and on the ground, ACKSYS RailBox using WiFi 6 enables very high-speed data transfer.



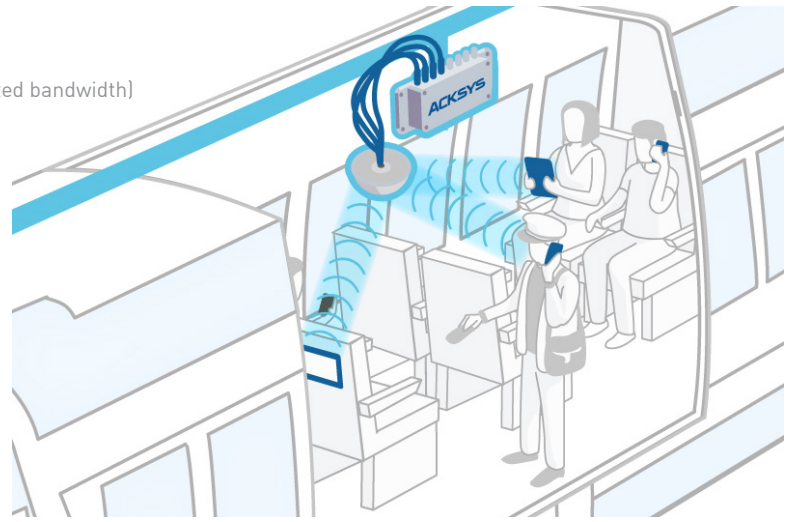
On the ground : RailBox
On board : RailBox

ON CARS WIFI COVERAGE

ACKSYS offers WiFi access points that ensure uninterrupted car coverage.
The advanced functionalities of ACKSYS RailBox enable the management of multiple networks reserved for passengers WiFi and on-board staff.

RailBox contributes to increasing the number of connected users, accelerating connection speeds and offering an enhanced WiFi experience.

RailBox
RuggedAir1000 for staff only (limited bandwidth)



INTER-CAR OR INTER-TRAIN COUPLING SYSTEM

WiFi has naturally emerged as the most efficient communication solution for a reliable and high-speed network.

The ACKSYS SRCC solution is based on wireless couplers that :

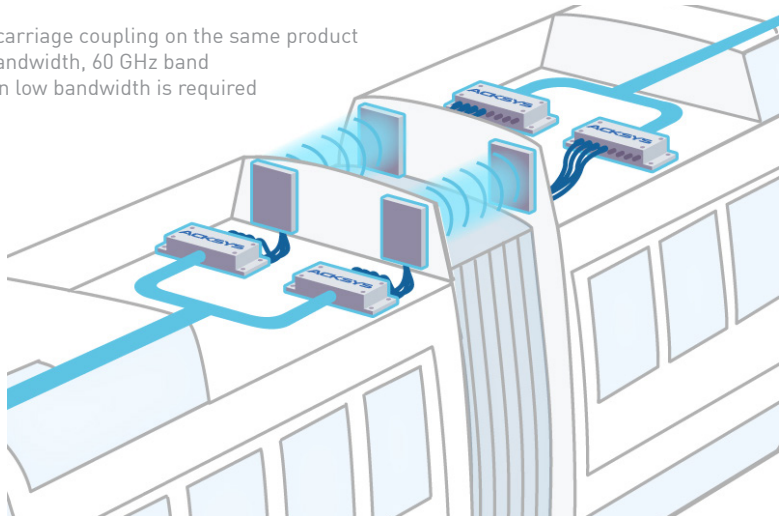
- support any train composition change
- provide a reliable and redundant on-board network

It meets all needs: video surveillance, passenger information, WiFi access for passengers, etc.

SRCC : SMART REDUNDANT CARRIAGE COUPLING

- Redundant on-board network with 2 WiFi couplers at the ends of each car
- Self-forming network: automatic association of cars in any order
- Intelligent pairing system preventing interconnection with neighboring train networks

RailBox: flexible, passenger AP & carriage coupling on the same product
RailBridger: easy to install, high bandwidth, 60 GHz band
RuggedAir1000: cost effective when low bandwidth is required



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

HIGHLIGHTS
OF ACKSYS RAIL SOLUTIONS

PRODUCTS DESIGNED FOR RAILWAYS
- IP66
- WiFi radio : EN 300 328, EN 301 893
- LTE radio : EN 301 908, EN 301 511, EN 303 413
- EMC : EN 50155, EN 50121
- Safety : EN 45545, NF F16-101, EN 60950, EN 62311
- Environmental : EN 61373, EN 60068
- Cybersecurity : EN 18031

SECURITY
- VLAN, QoS/WMM, tunnel, firewall
- WPA2/WPA3, 802.11i, 802.1x radius authentication, Rogue AP detection

DUAL RADIO PRODUCTS
- 1 radio for inter-car communication and 1 for on-board WiFi coverage
- 2 WiFi radios for simultaneous transmission on 2.4 GHz and 5 GHz or 5 GHz and 6 GHz bands
- 1 WiFi and 1 cellular radio with automatic switchover from one to the other depending on coverage area

SECURE & HIGH-PERFORMANCE WIFI COVERAGE
- Passenger network separated from service network (VLAN, QoS/WMM, tunnel, firewall)
- 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, Rogue AP detection
- Load balancing
- Band steering
- Client roaming control
- Association control per SSID
- Passpoint/Hotspot 2.0, open roaming

PRODUCTS FOR MULTIPLE ARCHITECTURES
- Bypass relay option for "Daisy Chain" Ethernet topologies
- On-board : dual radio APs
- On-ground : Triple radio APs for on-ground communication + IP backbone setting
- 24-110 VDC or PoE power supply

MULTIPLE REDUNDANT MECHANISMS
- Redundant train-to-ground communication, dynamic front/rear radio selection (VRRP)
- Equipment redundancy (WiFi, Ethernet, power supply)

500 MBPS THROUGHPUT AT 350 KM/H
- Connect before break (CBB) technology
- Packet error rate (PER) < 0.1%

SIMPLIFIED MAINTENANCE
- Configuration stored on a removable key

DIRECT CONNECTION TO TRAIN POWER SUPPLY
- Dual isolated power supply input 24-110 VDC

5-YEAR WARRANTY INCLUDED

WAVEMANAGER (on premise or cloud) ADMINISTRATION TOOL
- Simplified deployment
- Equipment monitoring
- Preventive maintenance
- Troubleshooting

WIFI ACCESS POINTS & CELLULAR ROUTERS FOR RAILWAYS

EN 50155 / 5 YEAR WARRANTY	 RailBox	 RuggedAir	 RailTrack	 RailBridger
Function	Cellular router or dual-radio WiFi access point	WiFi access point, client, repeater	WiFi access point & backbone repeater	Point-to-point bridge
Recommended for	Ground infrastructures & onboard	Onboard	Ground infrastructures & tunnels	Onboard
Applications	IOB, train to ground, carriage coupling, high speed data offload	Carriage coupling, WiFi coverage	Train to ground	Carriage coupling
WiFi Interface	Single or dual radio WiFi 6: 2.4 / 5 GHz WiFi 6E: 6 GHz Mu-MIMO 4T4R	Single radio WiFi 5 2.4 / 5 GHz	Triple radio WiFi 4 and WiFi 5 2.4 / 5 GHz	mmWave 60 GHz
Cellular Interface	Dual SIM 4G LTE / 5G* GNSS multi-constellation	N/A	N/A	N/A
Max. number of clients connected simultaneously	512 per radio	125 per radio	N/A	N/A
TECHNICAL SPECIFICATIONS				
Ethernet Interface	2 x 2.5 Gbps M12	2 x 1 Gbps M12	2 x 1 Gbps (M12) 2 x optical fiber (SFP cage) PoE+ PSE injector	1 x 2.5 Gbps M12
I/O	1 isolated input 1 isolated output			N/A
Dimensions (mm)	80 x 175 x 57	80 x 175 x 57	305 x 200 x 75	120 x 120 x 20.25
Power supply	Redundant - Isolated 24 to 110 VDC - PoE +	Redundant - Isolated 9 to 48 VDC - PoE	Isolated 110 to 230 VAC (50 / 60 Hz)	PoE
Environment Operating temperature IP rating	Extended : -40°C to +70°C, +85°C for 10 mn EN 50155 / EN 45545-2 / EN 61373 / EN 60068 IP66			-40° to +70°C EN50155/EN45545-2/EN61373 IP-69K
FUNCTIONALITIES				
Roaming	CBB 0 ms	Fast roaming < 30 ms	N/A	N/A
Mesh (802.11s)	✓	✓	✓	N/A
Security	EN18031 with firewall, DoS, https, MAC filtering, WPA2/WPA3-Personal & Enterprise (IEEE 802.1X/RADIUS), L2 tunnels (GRE), VPN (OpenVPN, IPsec), SNMP V3, WIDS, Rogue AP detection			Management VLAN, SNMP v3, encryption AES 128
Ethernet networking	Frame filtering, bridge, repeater, STP/RSTP, VLAN, WMM QoS, DHCP (server and client), DNS relay			Bridge
Ethernet routing	Multicast (PIM), IP redundancy (VRRP), static routes, NAT router, router			Layer 2 bridge mode
Administration	http, https, SNMP agent (V1, V2C, V3), WaveManager administration software, MQTT			SNMP v3, https using web browser
Bypass relay option	✓	-	✓	N/A
C-Key**	✓	✓	✓	N/A

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

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

RailBox range of products is designed for railway:

- Certifications : EN 50155, EN 50121-4, EN 45545, EN 61373 and EN 60068-2,
- Dual isolated power supply 24-110VDC (available also with PoE),
- Aluminum enclosure IP66, rugged connectors (Ethernet/ power supply : M12 ; antennas : QMA),
- Manufacturing process according to IPC 610 class 3,
- ACKSYS guarantees the reliability of all its routers with a 5-year warranty (warranty extension is also possible to cover up to 10 years).

> CUSTOMER SERVICE COMMITMENT

ACKSYS expertise and successful experience on the railway market brings value from the design of the project to commissioning and after sales support.

ACKSYS
COMMUNICATIONS & SYSTEMS

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

Its expertise and high quality standards allows it to meet the most stringent requirements of its target markets: transport (rail, road), industry (M2M, IIoT, automation), mining, oil & gas.

Its highly qualified, closely-knit R&D, technical and sales teams are able to respond precisely to its customers' expectations, assisting them from the definition of their needs right through to on-site deployment. Thanks to a structured distribution network, ACKSYS is present on all five continents.

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