

# Bus & Tramway

Wireless communication solutions  
for connected vehicles



**ACKSYS**  
COMMUNICATIONS & SYSTEMS

# Bus & Tramway

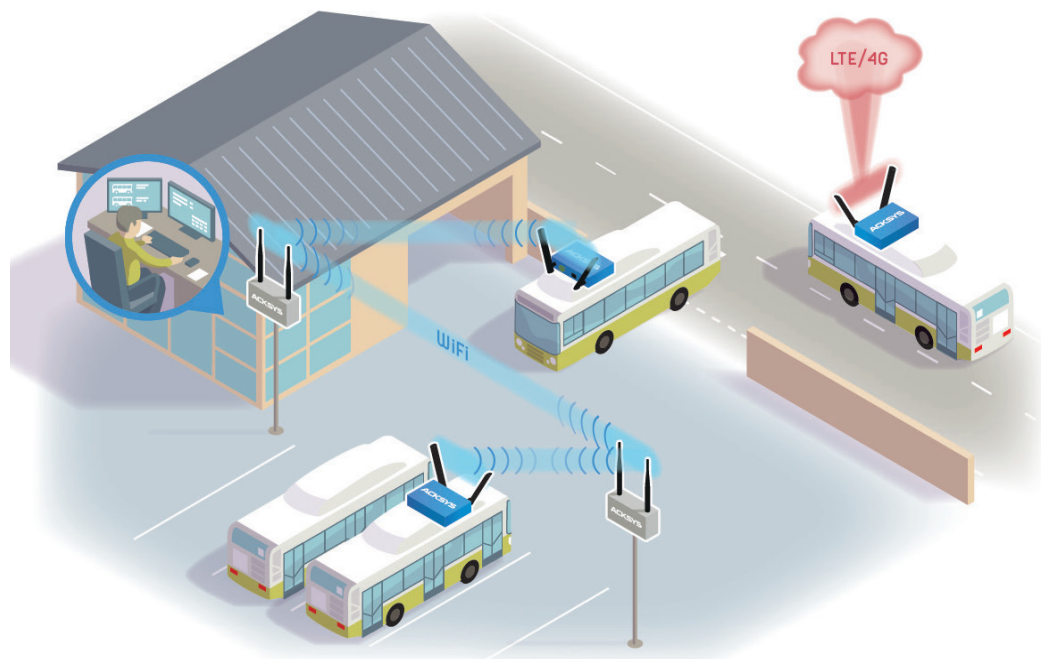
## Connected vehicles...

To provide even more services and safety to users but also to manage their fleet efficiently, operators need to exchange real-time operating data in motion or at the depot/station (video surveillance, ticketing, passenger counting, PIS...) with buses and trams.

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

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

Only one router per vehicle is needed, simplifying deployment and allowing reduced operating and maintenance costs.



DATA  
TRANSFER

STREAMS  
MUTUALIZATION

WIFI <-> 4G/ LTE  
SWITCHOVER



## ... for an optimal quality of service

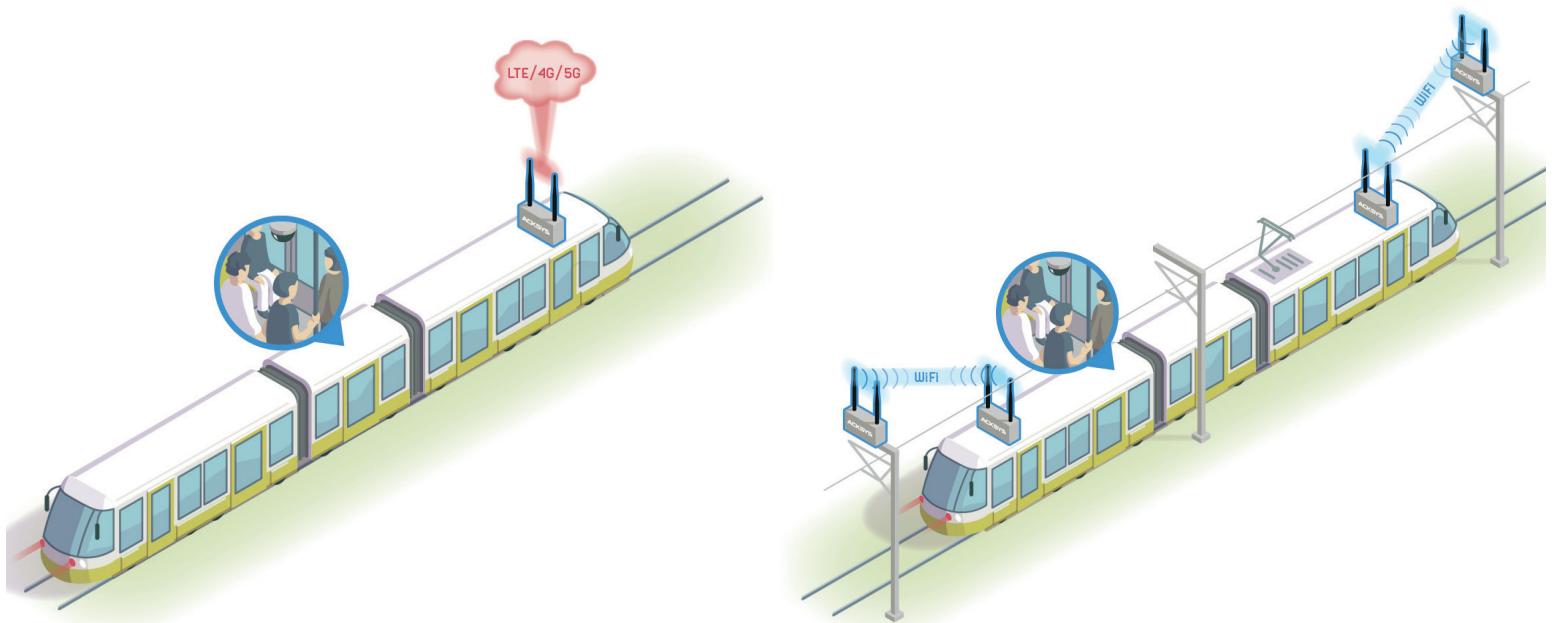
### > ACKSYS RANGE OF RUGGED WiFi/4G ROUTERS ALLOWS A SEAMLESS DATA TRANSFER

ACKSYS devices offers auto-switch & failover between WiFi and Cellular networks depending on network availability, ensuring a seamless data transfer.

In the specific case of trams, when the 4G/LTE network cannot provide a satisfactory level of service or when

cellular communication costs become prohibitive (e.g: real-time CCTV, on-board entertainment...), ACKSYS is able to propose a high availability WiFi infrastructure deployed along the track.

ACKSYS guarantees a high speed continuous and seamless connectivity thanks to its secure ground access points and on-board WiFi clients (Connect Before Break technology : packet loss rate < 0.1%).



SEAMLESS  
CONNECTIVITY

HIGH BANDWIDTH  
SOLUTIONS

CENTRALIZED  
ADMINISTRATION

“

ACKSYS offers devices tailored for both **ground** and **onboard** use

”



## SIMPLIFIED DEPLOYMENT

- Centralized administration (WaveManager software)
- Streams mutualization : a single embedded router, accessible to all the vehicle's equipment
- Identical IP addressing scheme in all vehicles without interconnection risks
- Mesh networks and multi-radios access points to simplify the deployment of the ground WiFi



## MOBILITY

- (WiFi) High-speed data transfer in motion (fast roaming <30 ms or 0 ms depending on models)
- Auto-switch & failover between WiFi and Cellular networks



## SECURITY

- IEEE 802.1x (radius)
- Safe tunnels (OpenVPN)
- Built-in firewall
- Network isolation (VLAN)...









## PRODUCTS DESIGNED FOR TRANSPORT

- Rugged solutions for on-board and ground-based WiFi infrastructures
- Extended operating temperature (up to -40°C and + 75°C depending on models)
- RJ45 or M12 connectors
- UTAC E2 - ECE R10 - compliant (buses)
- EN50155 (IEC61373)/EN50121-3-2 compliant (trams)
- EN61373 (shocks/vibrations)

BUS/TRAM  
& GROUND

MADE IN  
FRANCE

## Cellular routers & WiFi access points for public transportation

	 <b>AirWan</b>	 <b>AirBox</b>	 <b>AirBox LTE</b>	 <b>AirXroad</b>	 <b>RuggedAir</b>	 <b>RailBox LTE</b>
<b>Function</b>	WiFi router	WiFi router	WiFi, LTE/4G router and GNSS	WiFi router	WiFi router	WiFi, LTE/4G router and GNSS
<b>Market</b>	BUS	BUS	BUS	BUS	TRAM - GROUND	TRAM
<b>WiFi Interface</b>	802.11n 2.4 / 5 GHz	802.11n 802.11ac 2.4 / 5 GHz	802.11n 2.4 / 5 GHz	802.11n 2.4 / 5 GHz	802.11ac 2.4 / 5 GHz	802.11n or 802.11ac 2.4 / 5 GHz
<b>Cellular</b>	2G / 3G / 4G LTE GNSS	-	2G / 3G / 4G LTE Dual SIM GNSS	-	-	2G / 3G / 4G LTE Dual SIM GNSS
<b>TECHNICAL CHARACTERISTICS</b>						
<b>Ethernet Interface</b>	1 x 10/100 + 1 x 10/100/1000 RJ45	2 x 10/100/1000 RJ45	2 x 10/100/1000 RJ45	1 x 10/100/1000 M12	2 x 10/100/1000 M12	2 x 10/100/1000 M12
<b>I/O</b>	-	2 isolated inputs 2 isolated outputs	2 isolated inputs 2 isolated outputs	-	1 isolated input 1 isolated output	1 isolated input 1 isolated output
<b>Dimensions (mm)</b>	147 x 100 x 41	141.2 x 99 x 35	141.2 x 99 x 35	115 x 64 x 34	80 x 175 x 57	80 x 175 x 57
<b>Power supply</b>	7 to 48 VDC	Redundant 9 to 48 VDC + PoE	Redundant 9 to 48 VDC + PoE	9 to 48 VDC PoE	Redundant isolated 12 to 36 VDC + PoE	Redundant isolated 24 to 110 VDC or PoE
<b>Environment</b> Operating temp IP rating	-20°C to +60°C IP40	-20°C to +60°C IP30	-20°C to +60°C IP30	-40°C to +70°C IP66	-40°C to +70°C IP66	-25°C to +70°C or -40°C to +75°C IP66
<b>FUNCTIONALITIES</b>						
<b>Roaming</b>	WiFi < 30 ms and auto-switch & failover between WiFi and Cellular networks	< 30 ms	WiFi < 30 ms and auto-switch & failover between WiFi and Cellular networks	< 30 ms	< 30 ms	WiFi < 30 ms and auto-switch & failover between WiFi and Cellular networks
<b>Security</b>	SSID broadcast enable/disable, Firewall, VPN, DoS, WIDS, Secure TLS/SSL administration (https), SNMP V3, WPA2/WPA3, 802.1X authentication					
<b>Ethernet Routing</b>	Multicast (PIM), IP redundancy (VRRP), static routes, NAT router, router					
<b>Ethernet Networking</b>	Frames filtering, bridging, repeater, STP/RSTP, VLAN, DHCP (server&client), DNS relay					
<b>Administration</b>	http, https, SNMP agent (V1, V2C, V3), WaveManager administration software					
<b>C-Key*</b>	-	-	-	-	✓	✓

\* 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 commits to provide state-of-the-art technology, products and training to keep its customers, distributors and VARs in the forefront of the communication age.

**ACKSYS**  
COMMUNICATIONS & SYSTEMS

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 meet any industrial application need, any time.