



**WIN**

## **RADWIN OFFERS A BROADBAND WIRELESS MOBILITY SYSTEM DESIGNED FOR TRAINS, METROS, MILITARY AND MARITIME APPLICATIONS**

RADWIN has developed a unique and cost effective solution that provides high capacity wireless connectivity for moving trains and high speed vehicles.

RADWIN's Wireless Mobility system was designed to operate in intense mobility environments, delivering up to 30Mbps net throughput for trains, metros and vehicles travelling at speeds of up to 300Km/h and with base stations deployed at distances of up to 10km apart.

RADWIN's wireless system assures reliable delivery of real time, high capacity, high quality video streaming for surveillance and a range of applications including Train Control, Passenger Information systems, Internet access, on-board entertainment, advertising and more.

## Typical Applications

RADWIN's system meets the growing demands of high capacity mobility applications for trains, border and perimeter control, maritime and mines.

### **RAILWAY (METRO, LIGHT RAIL & TRAINS)**

Railways are economical, convenient and reliable but due to the growing number of commuters railway systems are more vulnerable to terrorist and criminal attacks. Deployment of real time video surveillance systems in stations and on trains can prevent these types of situations by identifying suspicious persons, activities or baggage.

RADWIN offers a reliable, high capacity, wireless networking system that provides:

- High-quality, real-time CCTV security surveillance systems
- Communication-Based Train Control (CBTC)
- Passenger internet access
- Passenger information systems

### **SECURITY – BORDER AND PERIMETER CONTROL**

Armies and agencies, responsible for securing borders and perimeters require a highly effective communications infrastructure to deliver real time video from the field to the command center and back to mobile patrol teams.

RADWIN's Border Control solution provides two way CCTV video streams between patrol vehicles and the command center via surveillance towers situated along the border. Radios on the towers are synchronized using RADWIN's GSP system for continuous, real time visual surveillance of the border. RADWIN also addresses the need for border surveillance using unmanned patrol vehicles.

### **MARITIME**

Today there is greater demand for real-time connectivity between maritime control centers and maintenance ships that provide services to oil and gas rigs and off-shore wind farms. By offering a high capacity and wide coverage wireless connectivity solution, RADWIN can assure stable and continuous communications for cruising ships, even in harsh weather conditions and rough seas.

### **MINES**

Mines are adapting to stricter standards by incorporating innovative technologies to improve safety measures and advance productivity through better control of operational information.

RADWIN's system addresses these needs by enabling real time video surveillance (live CCTV), backhauling to asset and human resource tracking systems, and real time communications between the miners and the control center. RADWIN solution provides wireless backhaul to efficiently transfer all operational information from the mines to the maintenance control center.

## RADWIN TECHNOLOGICAL ADVANTAGES

### Bi-Directional High Capacity:

RADWIN offers high data transmission rates of up to 30Mbps net aggregate throughput that can be used symmetrically or asymmetrically while maintaining a constant system performance level, independent of the moving speed.

### Low Latency and Delay Variation:

RADWIN solution has a low, constant latency (<3ms) regardless of traffic overload or spectral interferences which is ideal for high resolution video and bandwidth demanding surveillance applications.

### Wide Range Coverage:

RADWIN supports installation ranges between Base Stations of up to 10 Km, to secure a cost effective solution with a low investment in infrastructure.

### Work in nLOS/NLOS & Harsh Environments:

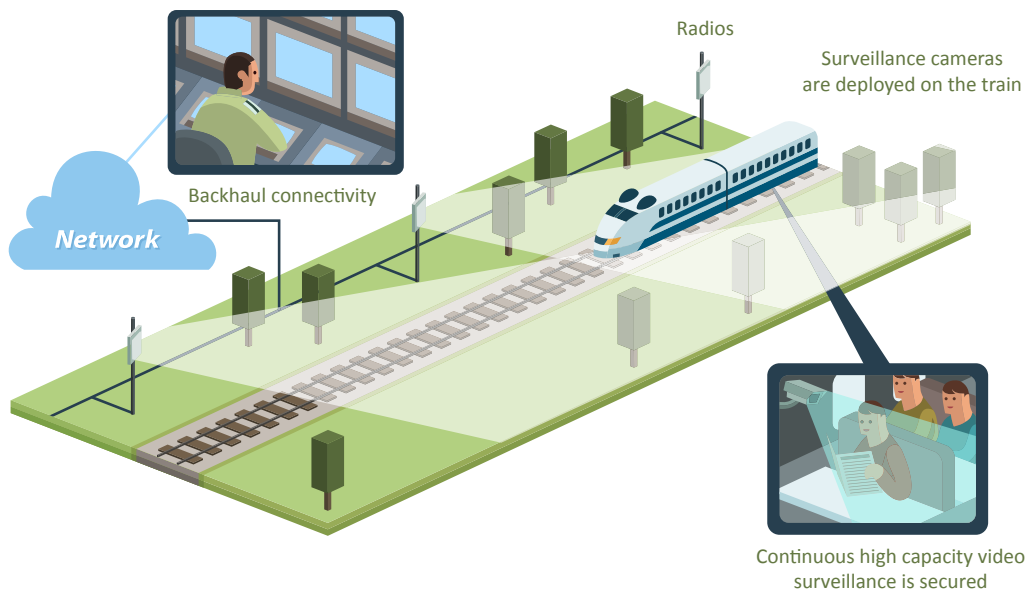
RADWIN solution, utilizing MiMO and OFDM technologies, is also equipped with space diversity techniques, advanced ARQ algorithms and other unique capabilities for robustness and high availability under harsh conditions.

### End to End Quality of Service

RADWIN solution supports delivery of various data services such as train control, online CCTV, VoIP, entertainment and Passenger information systems. All data services can run on the same wireless link with dynamic scheduling according to air interface changes and services priority.

### Simple Installation and Maintenance

RADWIN solution is extremely simple to install and maintain, enabling quick adaptation to different operational requirements and expansions.



## RADWIN's Technology Highlight

- » High capacity - up to 30 Mbps net aggregate per mobile unit for:
  - Public security (live CCTV)
  - Passenger information systems, Internet access, entertainment, digital signage
  - Real time Communication-Based Train Control (CBTC)
- » Asymmetric bandwidth between up and down links to reflect any traffic requirements
- » Seamless handover and low latency for smooth service and high video quality
- » Wide coverage using base stations placed up to 10 km apart for reduced costs
- » Designed for transportation reaching speeds of up to 300km/h
- » Wide choice of licensed and unlicensed frequencies in the 2-6GHz bands
- » A variety of channel bandwidth options: 5, 10 & 20 MHz
- » Secure communication for sensitive data delivery
- » Certified for European Railway Standards: EN50155 and EN50121

## Technical Data

Supported frequencies	Licensed and Unlicensed bands between 2.3-6GHz
Capacity	Up to 30 Mbps net aggregate throughput per mobile unit
Type of Modulation	2x2 MIMO OFDM with Space Diversity
Max Speed	Tested and approved up to 200 Km/h without performance degradation. Designed for higher speeds
Distance between base-stations	Up to 10 Km (depending on topology and radio regulation)
Channel bandwidth	5, 10 & 20 MHz
Max Tx Power	25 dBm / 316mW
Latency	<3 ms (typical)
Availability	Up to 99.999%
Quality of Service (QoS)	Packet classification to 4 queues according to 802.1p and Diffserv, Dynamic scheduling according to air interface Changes
Asymmetric bandwidth allocation	Configurable Uplink/Downlink asymmetric ratio
Handover between base-stations	Continuous radio link between base-stations and moving vehicle without service interruption
Security	AES 128
Power consumption	< 25Watts
Dimensions	19.5(w) x 27.0(h) x 8.0(d) cm
Weight	1.8 kg / 3.6 lbs
Operating temperatures	-35°C - 60°C / -31°F – 140°F
Humidity	100% condensing (totally protected against dust and against immersion up to 1m)
Fully outdoor solution	IP67
Certifications	EN50155, EN50121, CE
MTBF	>240,000 hours

*“We chose RADWIN’s broadband mobility solution because it secured 100% coverage with our unmanned ground vehicle, high capacity in the uplink direction and a very simple installation.”*

Noam Milles, System Engineer,  
GNIUS, Israel

*“We chose RADWIN’s broadband mobility solution because it enabled us to simultaneously stream high capacity mega pixel CCTV video and VoIP between Metro trains and the control center in real time without service interruption. RADWIN was the only company that had the solution to deliver 30Mbps net throughput while placing base stations every 1Km in the Metro tunnel.”*

Guliano Alesandro, CEO,  
ORANGE OS, Rome, Italy

## About RADWIN

Delivering best of breed wireless connectivity solutions, RADWIN is committed to providing a complete offering for the Sub-6GHz domain. Recognized as the market leader, RADWIN provides competitively priced products that achieve unmatched reliability, flexibility and installation simplicity.

RADWIN provides innovative carrier-class solutions that are deployed in over 130 countries around the world. Company success is due to swift delivery of high quality wireless connectivity products that secure unrivalled performance for broadband access, backhaul connectivity, private networks and specialized broadband mobility applications.

### **RADWIN 2000 High Capacity Wireless Mobility Solution Removes Backhaul Barriers for Transportation in Motion**

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