EVIDEN

# Enabling safe, smart and efficient railways

# Mission-critical Systems for Rail Transport

Railways entrust the lives of their passengers and the goods of their customers to complex technical systems. Eviden's cutting-edge solutions ensure safety, cybersecurity and operational efficiency across the entire railway network. With state-of-the-art equipment installed at trackside, onboard and at operations control centers, we deliver solutions that ensure dependable information flows, making it easy for railway undertakings and infrastructure managers to focus on their core business and competences.

Eviden also provides ground systems that enable the management, supervision and security of these devices. We offer end-to-end solutions including design, manufacturing, integration, testing and long-term support for hardware and software solutions.

Our expertise enables us to carry out large-scale projects in the following fields:

- Ground/embedded radio communication systems and equipment
- Passenger information
- Supervision and command control in audio and video
- Transportation on demand
- Maintenance and railway testing tools

## Our key digital solutions dedicated to the railway industry

### At stations, trackside and onboard

#### Passenger Information System

- Passenger information
- Public address
- Ground and onboard Infotainment
- Content creation and management

#### Radio Communication

- Secure train-to-ground transmission with onboard equipment (TETRA/WIFI/4G/5G radio, intercom and equipment linked to TCMS)
- 4G/ 5G networks
- MCx and IWF
- MCPTT gateway cab radio

#### Centralized Command and Control

- Command control
- Supervision
- Alarm escalation
- Remote diagnosis
- Video protection
- Multi-network dispatcher
- Voice recorder
- O&M

#### Railway System Services

- Design, build, commissioning and integration
- Multi-technology integration
- Testing and measurement
- RNP and IP network planning and engineering
- Supervision and renovation
- Generation of customer specific solution with own- and 3rd party products (e.g according to a SIL-2 process)
- Security services
- Multi-vendor care services
- Maintenance (lifecycle management of 20-25 years, spare part management)

**The GSM-R sunset is no longer a distant milestone. The time to prepare for the transition to FRMCS is NOW.**

Railway operators are facing the most significant communication transformation the sector has experienced in decades. Driven by the obsolescence of GSM-R, the demand for broadband and low-latency services, increasing cybersecurity challenges, and the adoption of FRMCS as the future European standard, the question is no longer why to migrate, but how to do it successfully.

FRMCS is far more than a replacement for GSM-R. It provides the communication foundation for the digital railway, enabling secure, high-speed connectivity for operational voice, data and video services, while supporting greater automation and future innovations.

Let's examine a situation demonstrating how our critical communication solutions were successfully deployed:

Imagine a train operating on the network. Through a private 5G infrastructure and FRMCS mission-critical services, the control center can access real-time video streams, use AI-powered analytics to detect abnormal situations or monitor passenger flows, and maintain continuous communication with onboard staff. If a passenger requests assistance via the train intercom, the call is securely routed through the train-to-MCX gateway to the dispatcher, who can seamlessly coordinate the response and include users from legacy TETRA or GSM-R networks during the migration period. At the same time, cybersecurity solutions protect onboard communications and file transfers, while centralized management continuously monitors both trackside and onboard equipment, automates software updates, and integrates with predictive maintenance systems. Intelligent video surveillance can also detect safety-critical situations, such as intrusions beyond the platform safety line, helping operators respond immediately.

This is the vision enabled by FRMCS: a secure, intelligent, and future-ready communication platform that supports the railway's digital transformation, while ensuring a smooth migration from today's legacy networks. The time to prepare is now.

# Empowering Mobility Solutions

Stay available, stay always on, stay connected. Don't lose connectivity onboard or trackside with our state-of-the-art radio solutions. Eviden ensures secure train-to-ground communications with onboard and trackside equipment such as TETRA, WIFI, 4G/5G radio and intercoms, all integrated with Train Control and Management Systems (TCMS).

## Lifelink Wireless 4G/5G

Lifelink Wireless private network is a compact modular radio network designed to bring the benefits of private mobile networks to mass transit organizations requiring secure mobile communication. It is easy to set up and manage; it can be easily extended with customer-specific applications and use cases.

Lifelink Wireless can be deployed as either a 4G LTE network or a full 5G NSA or SA network depending on the customer requirements. The solution's key features include high throughput, low latency, slicing and increased cyber security.

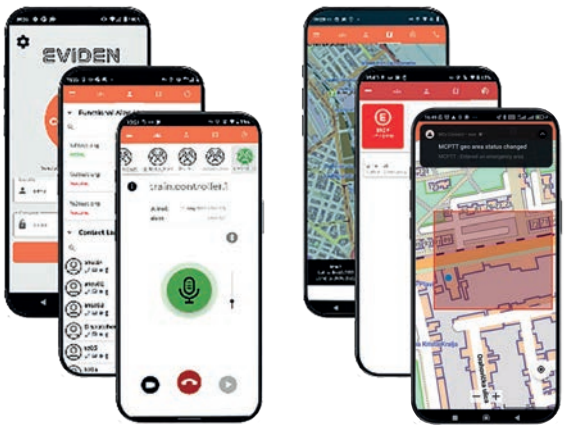
**5G Campus Networks – Added Value**

- High speed with 5G
- Low latency, as required for real-time communication
- High quality with exclusive licensed frequency that guarantees quality of service and prevents overload
- High security: Secure private 5G network owned by the enterprise
- High flexibility: 5G can be used for most use cases like data, voice, video, IoT, machines, robots, AGV and drones
- Reduced complexity: 5G replaces a variety of technologies like industrial Wi-Fi, and replaces expensive cabling
- High mobility: Complete network coverage indoors and outdoors for continuous permanent connection to the network and better mobility
- End-to-end application
- Compliant to 3GPP

## Lifelink MCx Connect

Lifelink MCx Connect is a 3GPP-compliant mission-critical push-to-talk solution which supports:

- **Group communication**
  - » Push to talk (half duplex group calls)
  - » Pre-arranged and dynamic group calls
  - » MCVideo and MCData
  - » Functional numbering (FRMCS-ready)
- **One-to-one communication**
  - » Full duplex calls
  - » Video calls
  - » Multimedia messaging
- **Emergency notification**
- **Multimedia chats and file transfers**
- **Product extension options**
  - » Dispatcher and Blue Forces Tracking (Geolocation)
  - » Broadband eMBMS multicast video and voice
  - » Direct mode operations
  - » Interworking / Gateway to other PMR technologies like GSM-R and TETRA
  - » Video analytics, warnings and alerts



## Lifelink Multinet Dispatcher

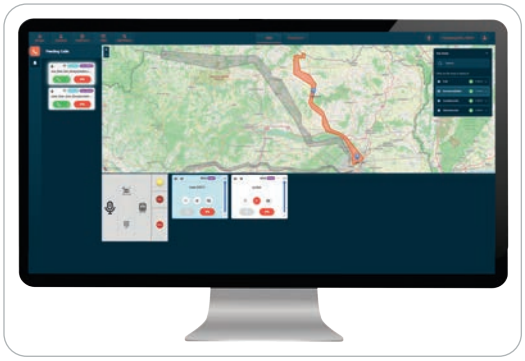
Eviden's Lifelink Multi-Network Dispatcher system is a highly reliable voice communication tool for line operators, depot managers or station managers. It interconnects multiple PMR technologies in a single solution.

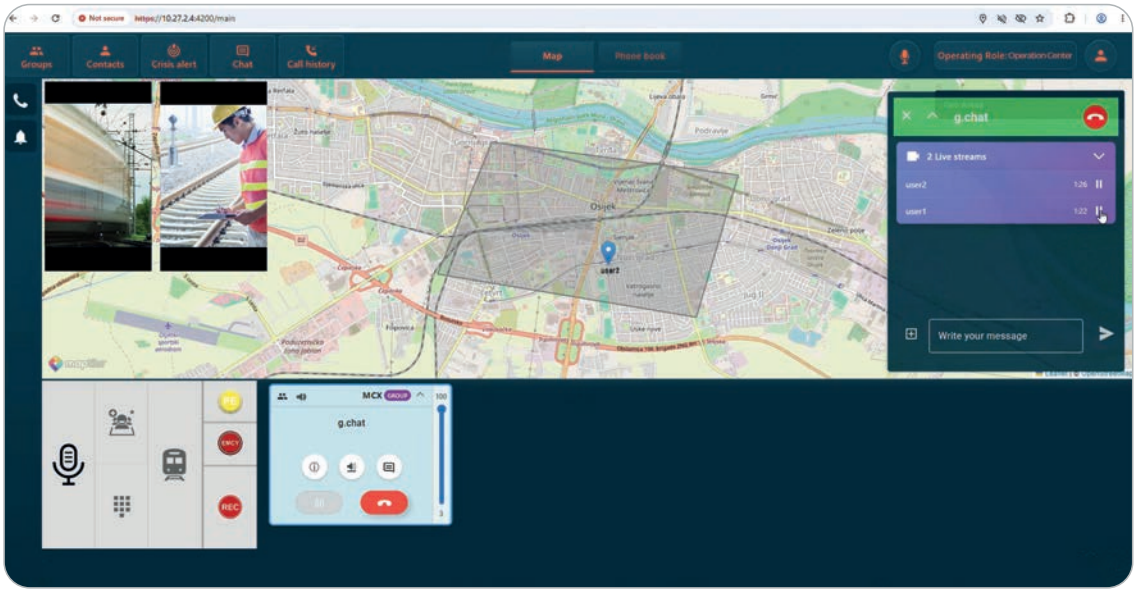
- Different communication technologies such as MCx, GSM-R, TETRA, LTE, PBX, VHF can be interconnected
- One user interface for all communication technologies
- Emergency handling support
- Individual calls and group calls across technologies
- Interconnection of multiple sites and technologies into one logical network
- Configurable built-in voice recording

## Lifelink Multinet Recorder

The Multi-Network Voice Recorder (MNVR) system provides highly reliable voice and data events recording for different technologies, allowing precise and comprehensive events monitoring, storage, search and replay. The solution is an integrated umbrella recording system with various digital communication networks over various network connections that supports the following multiple off-the-shelf interfaces:

- MCx
- GSM-R (E1)
- TETRA networks:
  - » Hytera API: IP or E1 based
  - » DAMM API: IP
  - » Airbus API: IP or E1 based
- Other networks:
  - » Passive SIP sniffing (port mirroring)
  - » E1 FTDM based connections
  - » Telephony calls connected via TETRA
  - » Analog line interface (via dedicated HW module)





## Cab Radio over MCx

An essential communication tool for trains, with or without drivers, Eviden's Cab Radio system ensures uninterrupted and secure communication, guaranteeing efficient management and optimal safety of railway operations. In manual train operations, it allows emergency, group and point-to-point calls via dedicated HMI software.

Automatize your line

- High security level: SIL 2 (Safety Integrity Level / Standard IEC 61508)
- No service interruptions; maximum reliability
- Flexible communication with TETRA radio and/ or 5G through MCx
- Discreet listening
- Passenger Announcement System (PAS)

Form Factor: Compact or 3U

- Integrated power supply module (72V-110V)
- CPU module with 5G / Wifi / GNSS
- External data plug

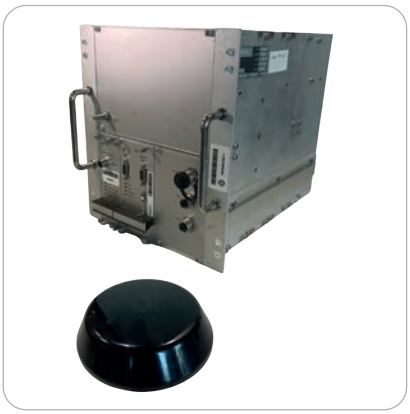
Options

- Multilingual automatic sound announcement service
- Automatic pre-recorded messages for the public
- Announcement by car

## High-speed ground/board transmission system

Discover our high-speed onboard-to-ground transmission system, offering ultra-fast and stable connectivity for seamless railway communications, even at high speeds.

- Wi-Fi transmission with roaming up to 80 km/h
- Multi-channel transmission with public 5G, private 5G and Wi-Fi
- Available redundancy of onboard equipment
- Load sharing capacity (5G version)
- Speed greater than 40 Mbit/s
- Seamless train network management



## Cybersecurity

At Eviden, we prioritize the security of your digital infrastructure through advanced technologies and rigorous processes. Our cybersecurity strategy is designed to deliver comprehensive protection across all layers of your network, ensuring both operational continuity and data integrity.

- Advanced analysis with real-time threat detection and analysis to keep your systems safe and secure
- Secure transfer of all logs and packages that are signed, traced, and securely stored; verifiable sender information and transparent processes that are compliant with the highest standards
- Managed Cybersecurity Services (MCS) with 24/7 managed services to protect your network from potential threats with continuous monitoring and response
- Identity management with secure access, ensuring only authorized users can interact with your sensitive data
- Network protection with advanced firewalls to segment and filter network traffic, ensuring high availability and security
- Access and authentication with strong access controls and protocols to protect your network
- Event management with system logs and secure security events, ensuring compliance and providing insights for better protection

Eviden's cybersecurity solutions are aligned with the highest industry standards, including the TS 50701 cybersecurity standard, ensuring all aspects of our systems meet or exceed the rigorous demands of modern security frameworks.

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# Eviden FRMCS Portfolio

**Trackside and Onboard**

### MCX Client
(Mobile App)

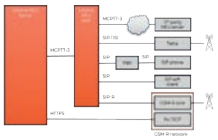
- Android, iOS
- Mobile / Tablet

### MCX Dispatcher
(Web App*)

Coordinates field-based operations on-site and from control rooms.

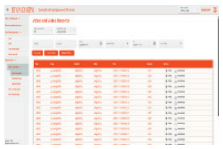
### MCX IWF
(Backend Component)

- MCX ↔ SIP (PABX)
- MCX ↔ SIP-R (GSM-R)
- MCX ↔ MCX
- MCX ↔ Others (TETRA,..)



### MCX Recorder
(Web App*)

- Record/Play, Search
- Voice, Video, Data



### MCX CMS
(Web App*)

Centralised Management for Provisioning, Management & Monitoring.

### MCx SDK

Integrate with equipment like Railway Onboard Unit or Trackside GW.

MCx SDK (JNI / C++)

### MCX Server

- MCX Backend
- MCX Application Server

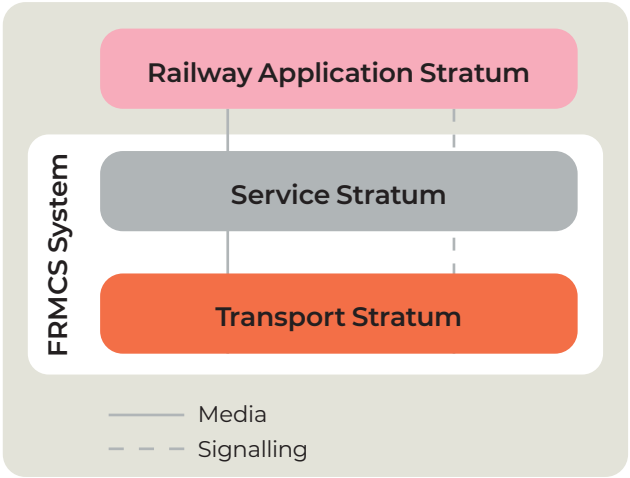
### Onboard

- Voice Cab Radio
- TOBA

### Specialized Services and Cybersecurity

- Specialized Railway Services:
- Design, Installation, Commissioning, Integration, Project Management, Long-Term Maintenance, Migration, Consulting ...)
- Cybersecurity : CRA, NIS2, IEC 62443, TS 50701,...

# FRMCS Service & Application Strata




EVIDEN ← **Dispatcher, Recorder** and other components

EVIDEN ← **MCX, GSM-R IWF** and other components

**5G Telecom Vendors** ← **5G** RAN and Core Network

FRMCS Strata based on FRMCS Specifications

**Flexibility, Scalability and Independent Evolution**

# Lifelink MCx IWF Interworking Function

## Seamless Integration, Supporting Migration

The MCx IWF plays a crucial role to allow parallel operation of different mission critical communication technologies and to facilitate the transition from narrowband systems to broadband mcx. Typical use cases can be found e.G. In transportation, public safety, ports and utilities. Eviden's Interworking Function (IWF) enables seamless integration and operation of legacy communication systems such as gsm-r, sip pabx or ppdr systems with mcx. The IWF facilitates a smooth transition and migration from GSM-R to FRMCS or PPDR to MCX.

## Standards compliance

The IWF is compliant with the relevant ETSI / 3GPP specifications like ETSI TS 23 283, ETSI TS 24 483 and ETSI TS 103 792.

## Interoperability Scenarios

| Scenario | Seamless interworking with | Availability |
|---|---|---|
| MCX ↔ **IWF** ↔ SIP | PABX or SIP soft clients | ✓ |
| MCX ↔ **IWF** ↔ SIP-R | For a smooth migration from GSM–R to FRMCS | ✓ |
| MCX ↔ **IWF** ↔ MCX | Integration with 3rd party MCX servers for distributed, edge-based architectures to enhance resilience and fault tolerance.<br><br>Scenarios for IWF deployment:<br>• For untrusted 3rd party MCx servers<br>• To restrict / isolate communication between MCx servers<br>• MCx servers with incompatible multiplexing / codec capabilities | ✓ |
| MCX ↔ MCX | No IWF needed for trusted and compatible 3rd party MCx | N/A |
| MCX ↔ Narrowband | Gateway to legacy LMR systems (TETRA, DMR, P25, ...) | On-demand |

**Multiple Ecosystems Connected into ONE Unified Environment**
**Enabling Migration, Interoperability, and Resilience**

## IWF Core Functions

- Addressing & Identity Mapping
  MSISDN / FN and role / functions ⟷ SIP URI and MCx identities
- Signalling Interworking
  SIP R-based (CSC) SGW/MGW ⟷ SIP / MCx
- Media Adaptation and Codec Negotiation
  Circuit switched (MGW) ⟷ RTP
  Transcoding (FR, PCMu/a, opus, AMR-WB) ⟷ AMR-WB
- Voice Services Interworking
  GSM-R voice services ⟷ MCPTT services (P2P, group, broadcast, ...)
- Messaging Interworking
  SMS ⟷ MCData / IP-based messaging
- Preservation of Railway Features
  Mapping of EIRENE functionalities (FA, LDA, REC, VBS/VGCS,...)

**Bridge Legacy Communication with Broadband MCx**

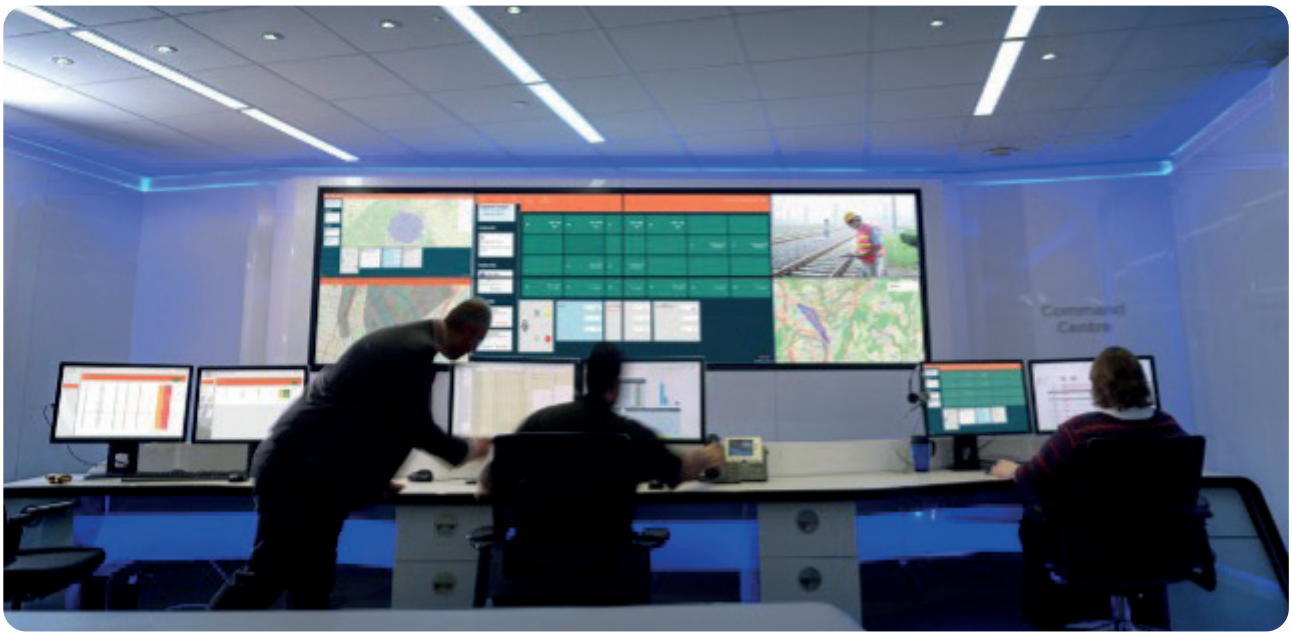
## Customer Value

Interoperatibilty across systems form different vendors
Enable co-existance of legacy/Mcx ystems in parallel like GSM-R / FRMCS or SIP PABX / MCx....
etc etc

# Onboard video surveillance

Eviden provides a complete range of systems with advanced command control and supervision capabilities such as onboard cameras, ensuring real-time monitoring and management.

- Integrated POE EN50155 onboard cameras
- Three types of cameras:
  - » Front camera
  - » Internal carriage camera
  - » Fish-eye camera
- Embedded recorder:
  - » Records video from onboard cameras
  - » Records signals from onboard microphones
- Ability to add TCMS information to metadata
- Secured remote updates of software and configuration
- Simple AI processing integration with people detection, abandoned package, people counting and more
- Compatibility with main commercial VMS to pool ground and onboard surveillance resources
- Remote digital video recorder functions with a remote video review and fast forward



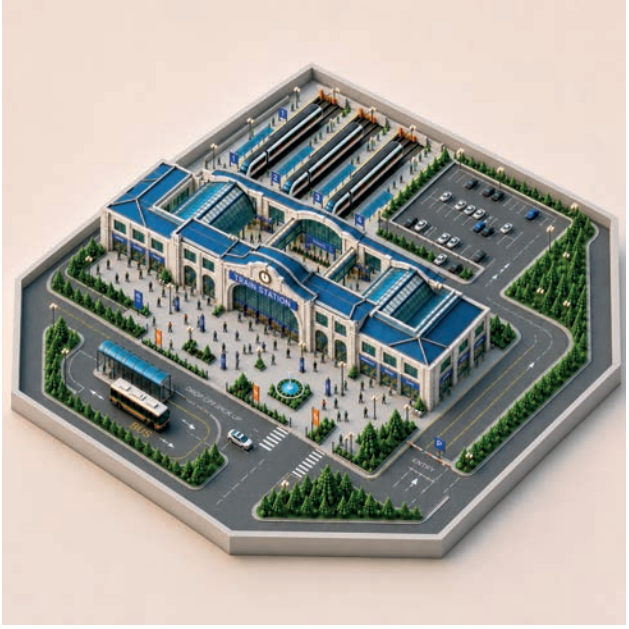
# EVIDEN

# Computer Vision Platform (CVP)

## AI-Powered Operational Intelligence for Rail Networks

IPSOTEK

an Eviden business



Eviden Vision AI, powered by Ipsotek VISuite, transforms existing video infrastructure into real-time operational intelligence for safety, security and efficiency across the railway network. Designed with privacy, cybersecurity and compliance at its core, Vision AI enables rail operators to leverage video and AI technologies while supporting GDPR requirements, data sovereignty objectives and responsible AI principles.

By combining advanced Vision AI, Generative AI (GenAI) and our patent technology, Vision AI helps rail operators improve passenger safety, strengthen security, optimize operations and enhance the passenger experience. From stations, platforms and depots to tunnels, level crossings and onboard environments, Vision AI enables operators to move from reactive monitoring to proactive, intelligence-led operations.

## Vision AI Use Cases

**Passenger Safety**

- Person-on-track detection
- Platform edge and yellow-line intrusion
- Detection of any fallen persons
- Lost child assistance workflows
- Escalator and concourse safety monitoring
- Congestion and evacuation support

**Station Operations**

- Passenger flow analytics
- Crowd density monitoring
- Queue management
- Occupancy monitoring
- Bottleneck identification
- Congestion alerts
- Service disruption support

**Security and Critical Infrastructure**

- Perimeter intrusion detection
- Fence-line breach detection
- Unauthorized access detection
- Loitering detection
- Abandoned object detection
- Vehicle threat detection
- Asset protection monitoring

**Trackside and Level Crossings**

- Obstacle-on-track detection
- Stopped vehicle detection
- Path deviation monitoring
- Right-of-way protection
- Track intrusion detection

**Depots & Maintenance Facilities**

- PPE compliance monitoring
- Restricted area protection
- Vehicle movement monitoring
- Operational utilization analytics
- Safety procedure compliance

## From Monitoring to Operational Intelligence

**See more.** Vision AI continuously monitors stations, platforms, trains and trackside environments.

**Understand more.** AI identifies patterns, risks and operational bottlenecks in real time.

**Respond faster.** Operators receive actionable alerts and decision support when it matters most.

**Operate smarter.** Automation reduces workload while improving network-wide awareness.

**Deliver better journeys.** Safer, more efficient and more reliable rail services for passengers and public safety.

## Vision AI and Generative AI

### From detection to decision intelligence

Vision AI not only detects and understands events across the railway network; it also helps operators rapidly interpret, investigate and respond through the power of Generative AI. By combining advanced video analytics with natural language interaction, automated summarisation and intelligent operational assistance, operators can transform vast amounts of video and operational data into actionable insights.

### Operational benefits

- Reduce time spent reviewing video footage
- Improve operator productivity and effectiveness
- Accelerate incident resolution
- Enhance situational awareness
- Support more informed and consistent decision-making
- Enable smarter, data-driven rail operations

# Supervision and Maintenance

Eviden is reinventing supervision by enhancing operational efficiency with a modernized monitoring system.

Our continuously updated solutions adapt to evolving vehicle technology interfaces, ensuring your system remains current. We offer modular, flexible systems that easily adapt to multiple lines and facilitate seamless integration and updates with minimal disruptions through a user-friendly, modern interface that simplifies maintenance work.

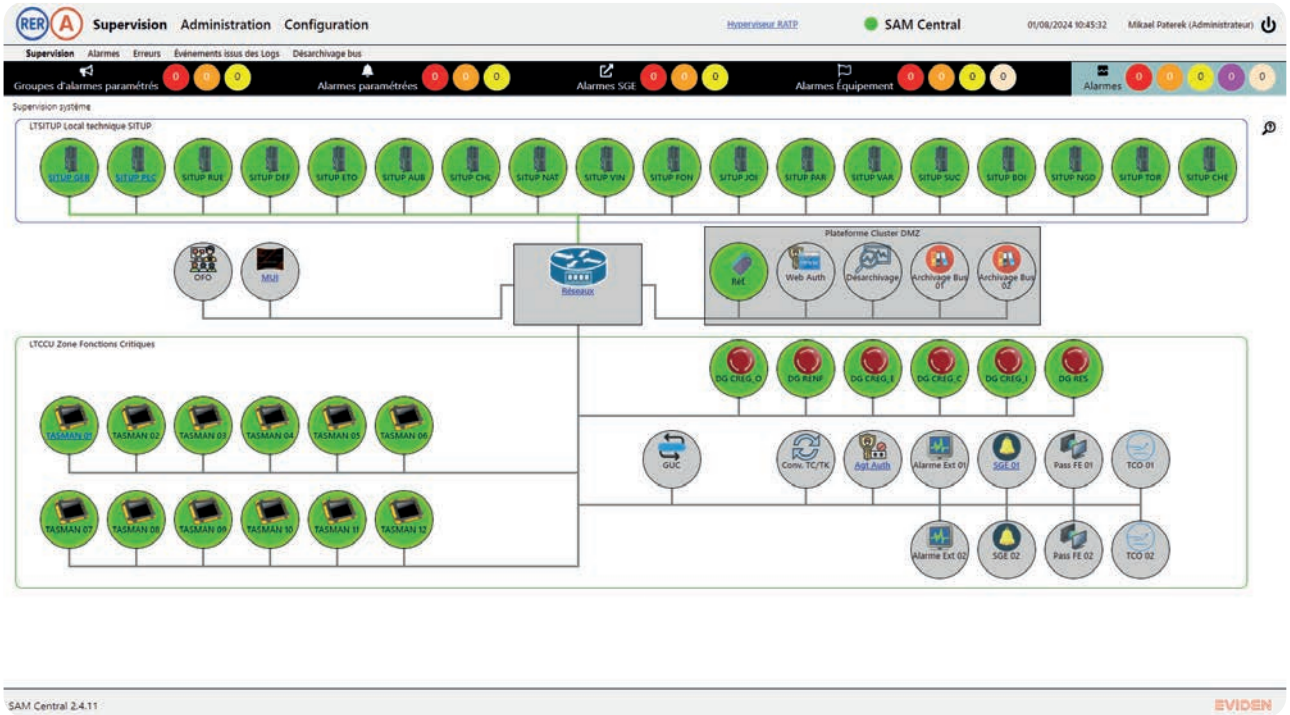
## Automatize your line

- Passenger alert management
- Ground and onboard camera management
- Passenger and driver call management
- Automatic announcement scenario management
- Archive video recording and replay

## Improve your maintenance monitoring system

Maintenance support system and onboard equipment management system

- Fleet management for onboard and ground equipment
- Firmware and configuration deployment with application date
- Rollback management
- Traceability management
- Recovery of logs
- Log export to cybersecurity tools or third-party tools
- Management with remote agents in offline mode
- Statistics
- Local or/and central maintenance monitoring system
- Web design based



# Eviden is committed to the development of the European railway network

## About Atos Group

Atos Group is a global leader in digital transformation with c. 56,000 employees and annual revenue of c. €7.2 billion (at the go-forward perimeter), operating in 54 countries under two brands - Atos for services and Eviden for products and systems. European number one in cybersecurity and a leader in cloud, Atos Group is committed to a secure and decarbonized future and provides tailored AI-powered, end-to-end solutions for all industries. Atos Group is listed on Euronext Paris.

## About Eviden

Eviden is the Atos Group brand focused on cybersecurity products, mission-critical systems and vision AI. A trusted partner to public and private sector organizations, Eviden deploys advanced analytics capabilities and helps ensure the robustness, continuity and resilience of its customers' operations. Leveraging more than 2,200 experts and 720 patents, Eviden helps protect people, data and critical infrastructures worldwide, at the convergence of intelligence, sovereignty and trust.

Safe in Life-Safe Online

## About Avantix

Avantix is an Eviden business that provides signals intelligence (SIGINT) solutions for intelligence, surveillance and reconnaissance (ISR) missions for operational and intelligence purposes in naval, land, aerospace and cyber environments. Avantix solutions integrate state-of-the-art electronic sensors and advanced information technologies to provide military and homeland security forces with detection, geolocation and processing capabilities for radar and radio signals. Avantix and its sovereign R&D capabilities

## Corporate Social Responsibility

#DoTheRightThing Now and for Generations to Come

Eviden is strongly committed to Corporate Social Responsibility (CSR), especially fighting climate change and promoting sustainability.

They have been active in CSR since 2008, with science-based targets validated by the SBTi. Their environmental efforts are managed through an Environmental Management System (EMS) based on ISO standards. The EMS is part of a broader integrated system (EIMS) that combines multiple certifications (quality, security, IT services). This integrated approach ensures environmental goals align with overall business objectives and maintain consistent standards.

bsi ISO 9001 Quality Management Systems CERTIFIED | ISO 14001 Environmental Management CERTIFIED | ISO/IEC 27001 Information Security Management CERTIFIED

PLATINUM Top 1% ecovadis Sustainability Rating SEP 2024

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