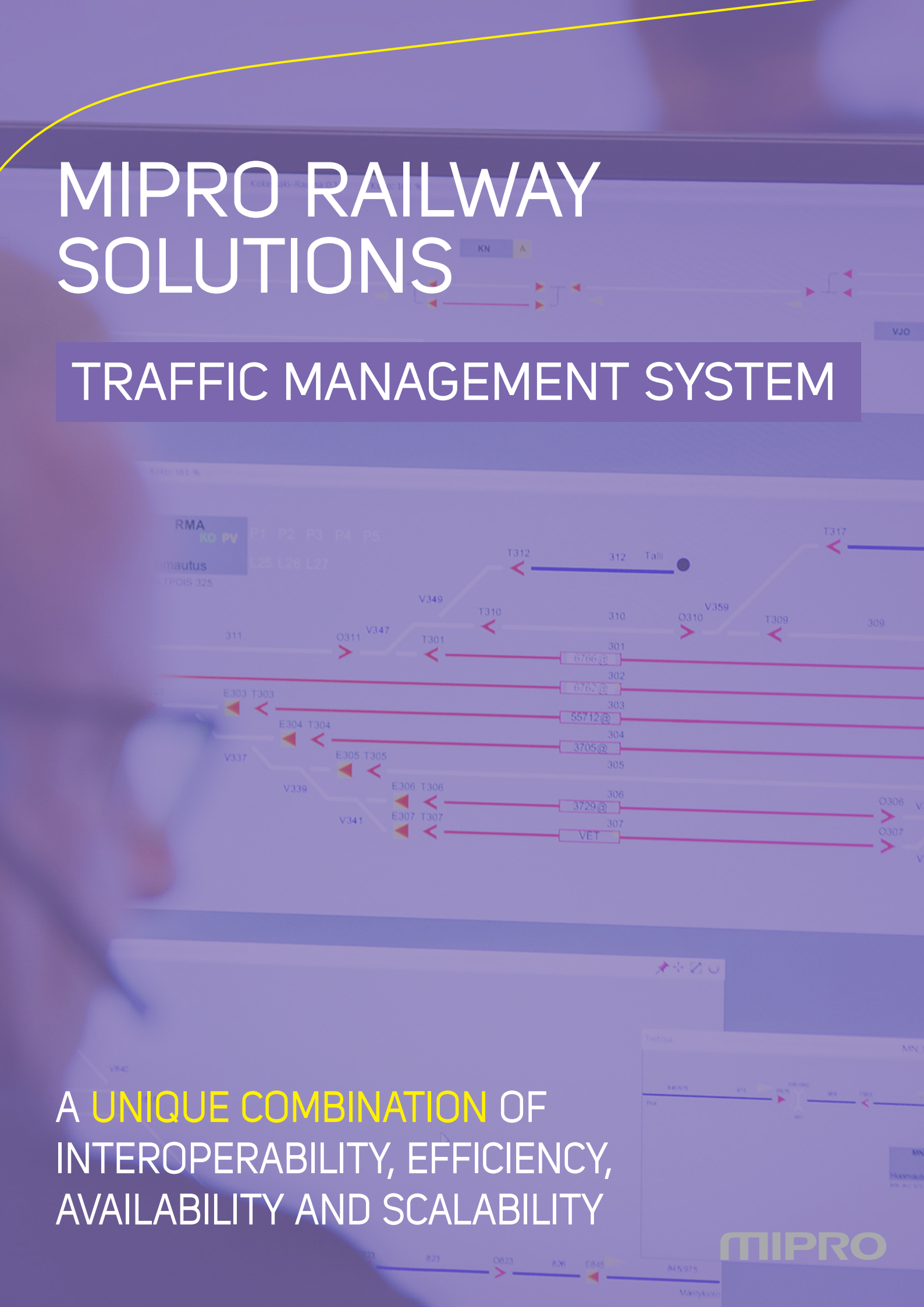
MIPRO RAILWAY SOLUTIONS

TRAFFIC MANAGEMENT SYSTEM



A UNIQUE COMBINATION OF INTEROPERABILITY, EFFICIENCY, AVAILABILITY AND SCALABILITY

MIPRO

DYNAMIC CONTROL ENVIRONMENT FOR EFFICIENT TRAFFIC MANAGEMENT

Traffic controllers must manage even larger amounts of data in their work as areas to be controlled have become wider. Today a traffic controller's work also requires constant attention and interaction with rail maintenance supervisors, train drivers and shunting work personnel.

Mipro's traffic management system takes the challenges involved in traffic controllers' work into account: it has been designed in co-operation with traffic controllers.

Mipro's traffic management system provides:

- Modular system architecture to meet customer-specific requirements and enable later modifications
- Flexible interfaces to different manufacturers' interlocking systems and other third party information systems
- Automatic functions to reduce manual work and increase capacity
- Clear and user-friendly traffic visualisation to enhance daily operation.

MODULAR AND SCALABLE IN SIZE AND FUNCTIONALITY

Thanks to the modular system architecture, Mipro's traffic management system is highly adjustable and flexible for specific application purposes. It is suitable for both small and large system installations, from a single stand-alone work-place to a fully-integrated control centre. You can build the system in stages and extend its scope and features at any lifecycle stage without vendor lock-in situation.

Mipro's system can be controlled centrally from a traffic control centre or via remote control sites; i.e. rail traffic can be operated through the TMS system from dispatcher work-stations or from local operation workstations based on the system distribution and customer requirements.

FLEXIBLE AND USER-SPECIFIC TRAFFIC VISUALISATION

Mipro TMS provides several traffic visualisation levels - from detailed dispatching views to high-level network situation overviews - to operate the system. Its windows and displays are designed to be easy to operate, adapt to different traffic situations, and to support automatic functions.

Further features to support dispatchers' work include

- Control screens based on real track geometries
- User and access rights according to roles and policies
- Commands to track elements
- Multiple views can be adjusted on a single screen or multiple screens according to needs.

AUTOMATIC FUNCTIONS FOR OPERATIONAL EFFICIENCY

Mipro TMS includes automatic functions that facilitate the dispatcher's daily work and reduce human errors. The auto-matic functions can be flexibly adopted at any stage of the system life cycle. They include

- Automatic station functions
- Automatic train number functions
- Automatic route setting (ARS)

Mipro's ARS is based on the highly optimized RouteEngine which monitors the status of all track sections and calculates routes.

AVAILABILITY THROUGH REDUNDANCY

The availability of the TMS system concept is achieved by using proven technologies and redundant platform features. Any track section connected to the TMS network can be controlled from any dispatcher workstation. The controlling platform is designed to tolerate unexpected hardware or component failures.

The hot-standby redundant architecture ensures uninterrupted operation in case of a single computer or component failure. The backup servers guarantee the availability of the system in case of any hardware system failure.

The server structure enables effective traffic controlling of several stations and the system architecture enables future modifications. The system can be updated or modified without affecting the normal traffic operation.

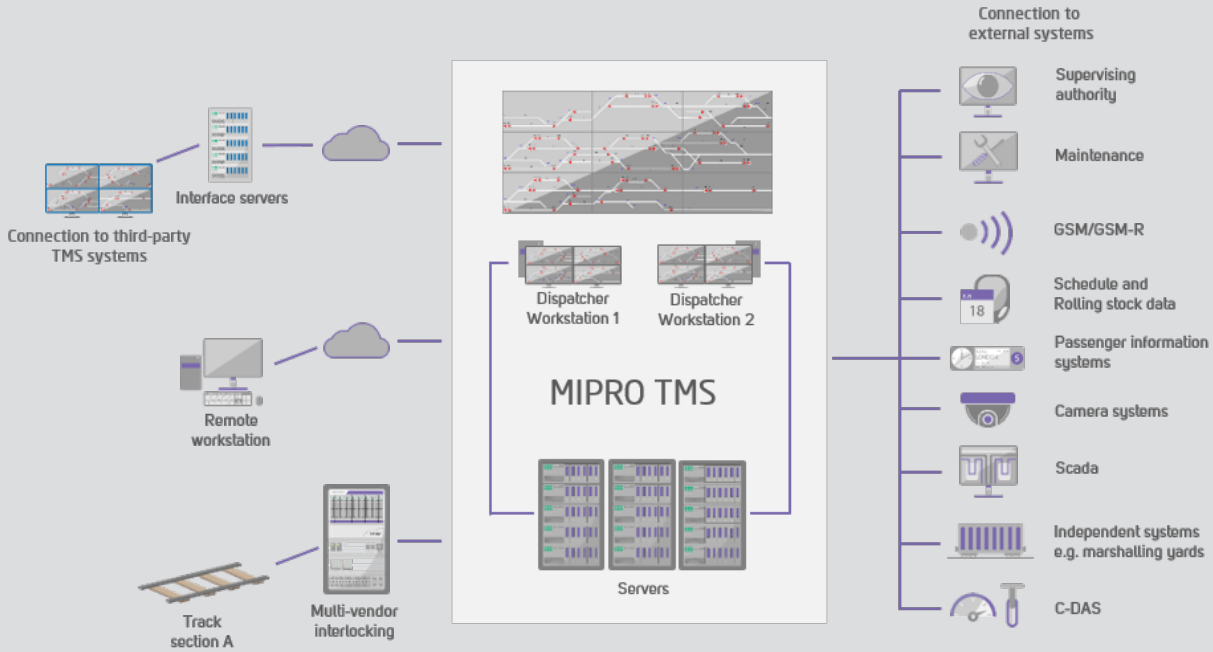
SIMULATOR AND PLAYBACK

The simulator and playback are basic features of Mipro's TMS system. The simulator is specially designed for training dispatchers and simulating real life traffic scenarios. Furthermore, it can be used to simulate various signalling and interlocking systems functionalities in a real traffic control environment prior to commissioning.

The simulator can be integrated into the playback event recorder, allowing recordings from the live environment to be used as basis for simulation.

BUILT IN MAINTENANCE AND DIAGNOSTICS TOOLS

Mipro's TMS includes a set of tools to help identify system issues. These tools can be used to view the status of the system and different system components and to identify and log system communication, HW and SW issues. The tools enable corrective actions, e.g. in case of hardware failure.



INTEROPERABILITY

The TMS system supports interfaces to various types of interlocking systems used in railway environment. The technology used in the interface depends on the related interlocking system (computer or relay based). The TMS system also supports interfaces to various external systems.

The Mipro TMS system is based on Commercial-Off-The-Shelf (COTS) hardware components and software application. The workstations utilize Microsoft Windows and Linux operating systems, which ensure easy integration of third party applications.

INTEROPERABILITY

Flexible interfaces to third party systems

ADVANCED AUTOMATICS

AVAILABILITY

High quality SW and HW design

SCALABILITY

Modular system architecture

FEATURES

- Modularity for flexible system structure and functionality
- Easy adaptation - the system connects seamlessly with existing systems, processes and equipment
- Flexible configuration - you can control the system centrally from a traffic control centre or via remote control sites
- Ease of use - the system provides unified user interface functions regardless of the interlocking technology
- Availability - you can rely on proven technologies and redundant platform features

REFERENCES

Mipro's rail traffic management system manages nearly 4000 rail track kilometres in Finland. For example

- Modernisation of Western Finland's traffic control, 2014-2019
  The project (TAKO) included the existing and new track sections in the area covering about a quarter of the Finnish railway network - that is about 1400 track kilometres (875 miles).

READ MORE

For information about our railway interlocking and situational awareness solutions, please see the brochures:

- Mipro Railway Solutions: Interlocking System
- Mipro Railway Solutions: Mipro REGO Situational Awareness

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Mipro is specialised in railway and industrial systems. Our systems are used for safety management in railway and metro services and industry processes as well as for controlling processes in water and energy management.

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Our operations are managed in accordance with an integrated management system certified according to ISO 9001 standard, and an environmental system certified according to ISO 14001.