

# The Alcatel-Lucent Integrated Control and Management System



## Seeing the full picture

A real-world, real-time view of your railway — for enhanced management and superior emergency response.



See it all.

Respond in seconds.

With increasing numbers of passengers, railway operators are faced with rising expectations to keep travellers safe and secure, whilst optimizing the efficiency of their operations. At the same time, the systems and technologies they rely on to provide that safety and security are growing in complexity and multimedia richness, which is proving inefficiencies in traditional automation solutions. An all-IP 'Manager of Managers', Alcatel-Lucent's Integrated Control and Management System (ICMS) synthesizes and brings all the pieces together to help operators gain a global view of their operations and respond instantly when situations arise.

# Making sense of the big picture

In most railways today, safety and security, operational control and passenger experience are managed through a multitude of devices and systems, each controlled by independent, separate platforms. To keep passengers safe and secure — both in routine operations and unexpected situations — railway Operation Control Center staff need the ability to continuously view and make sense of a huge amount of critical information. They have to quickly and precisely localize alert situations. And they need to minimize the risk of failure for crucial information and data streams.

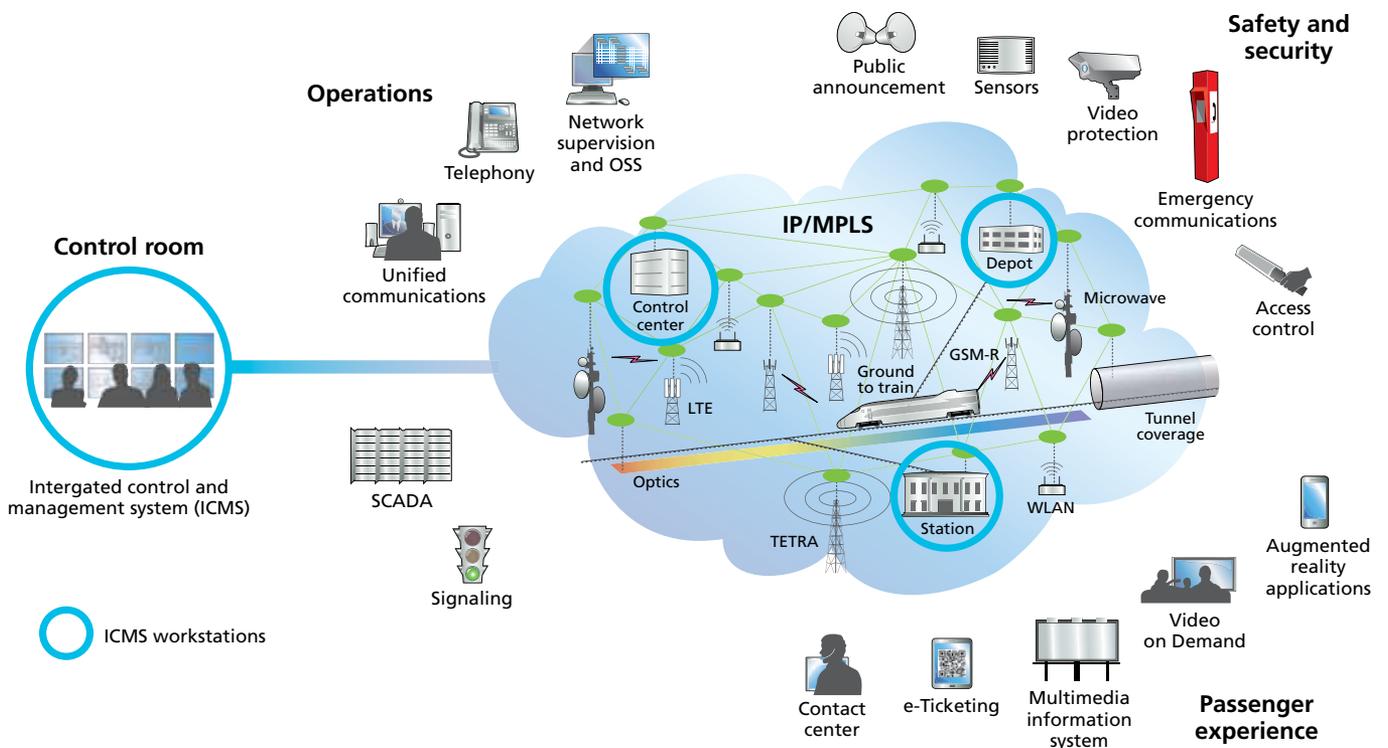
One of the keys to more effective safety and security control is giving Control Center staff a consolidated view of system data — filtering inputs and giving them a real-time, real-world view of the railway through a single, coherent interface. And because timing is crucial when emergencies arise, staff need to be able to focus on essential decision points, with the rest taken care of by reliable automated processes and the implementation of best practices.

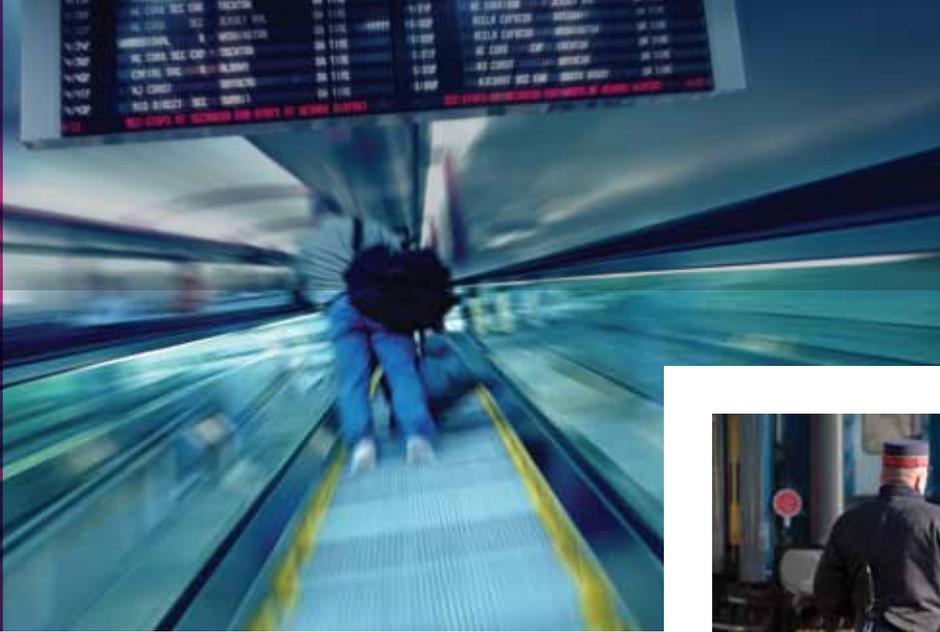
## MULTIPLE SYSTEMS, ONE LAYER

ICMS can link and control any number of technologies for a variety of subsystems:

- Telephony
- Data network (IP/MPLS, SDH)
- Radio network and ground-to-train communications
- Video protection and analytics
- Emergency communications
- Access control
- Public address (PA) systems and digital voice alarms
- Multimedia information systems (clocks, passenger information displays)
- Automatic vehicle location systems

Figure 1. Alcatel-Lucent vision of Dynamic Communication for Railways





## Alcatel-Lucent ICMS

### Managing your management technologies

The Integrated Control and Management System is an innovative umbrella platform that controls a wide variety of technologies and subsystems from multiple vendors. Functioning as a 'Manager of Managers,' it enables staff at Operations Control Centers to oversee any number of communication, passenger information and security systems through a single Graphical User Interface (GUI). It automates process and provides superior network supervision and ICT security while making systems control an easy and intuitive task through 3D maps and real-time navigation.

### Simplifying the complex

ICMS represents a unique approach to safety, security and communications, unifying control of information and security systems to reduce costs and increase passenger safety.

Realistic 3D models of en-route stations create an intuitive monitoring process for control room staff, while correlation and root cause analysis allow for rapid recovery plans on telecommunications infrastructure. Automated workflows increase efficiency, allowing operators to supervise and define different processes dependent on the threat scenario. ICMS easily integrates operational functionalities such as service-level agreement management, trouble-ticketing, and inventory and asset management. Its multi-monitor workstations help reduce capital and operational costs (CAPEX/OPEX) by requiring less equipment to deliver full functionality. And because ICMS is device agnostic, you can always bring new technologies into the mix in the future.



### THE ICMS PHILOSOPHY

To enhance safety while streamlining operations, the ICMS solution takes a multi-layered approach:

1. Openness to any device and management platform, converging multiple technologies on one IP network
2. Manager of Managers — allowing many separate management platforms to be controlled on a single flexible layer
3. Unified GUI that's intuitive and adaptable to different users.

### SAMPLE SCENARIO: PASSENGER FLOW CONGESTION ALARM

- Video analytics detects alert on congested escalators
- Area of emergency identified on inventory system
- Control room staff is provided with an automatic visualization of the location of the alert on a realistic 3D map
- Operator is alerted and empowered to control camera pan-tilt-zoom (PTZ)
- Operator starts recording and calls workforce via broadcast call and SMS/MMS
- Duty Safety Manager evaluates situation and pushes command to E&M SCADA system, releasing evacuation doors
- Pre-recorded specific Public Announcement is broadcast for passengers in the affected areas only
- Text command is sent to public information displays (PIDs) installed in the affected area

## YOUR RAILWAY ENVIRONMENT IN 3D

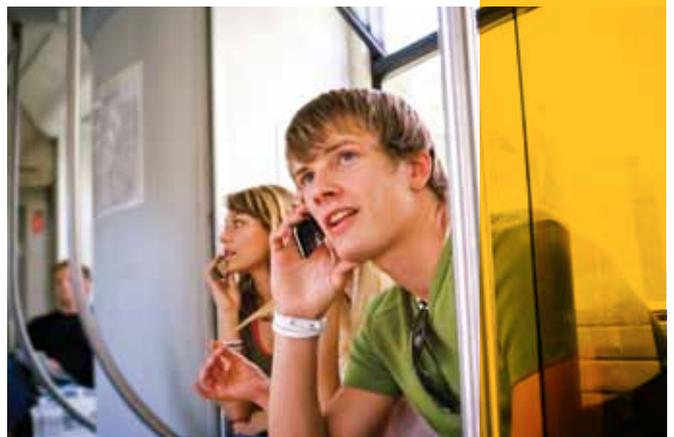
Prioritizing efficiency and ease of use, a key component of ICMS is its innovative, advanced 3D GUI that depicts your railway environment as it actually is — allowing Control Center operators to put themselves in the scene and make better informed decisions. The GUI is based on a 3D Computer Assisted Design (CAD) map of your entire system, including:

- En-route station maps
- Historical alarm displays for all subsystems
- Live banner with incoming emergency calls and queue list
- Video streaming from station platforms and trains
- Network monitoring

### Complete control

ICMS provides total control over multiple information streams through a single management layer through:

- An intuitive GUI with advanced 3D modelling
- Fingertip control of all key equipment
- Easy control of the various telecom subsystems such as transmission network (WAN/LAN), radio, emergency telephony, CCTV, public information displays, public address and voice alarms
- Improved compliance with railway operational procedures through configurable workflows
- Multiple failure prevention for all critical services through correlation and root cause analysis





## A three-tiered architecture

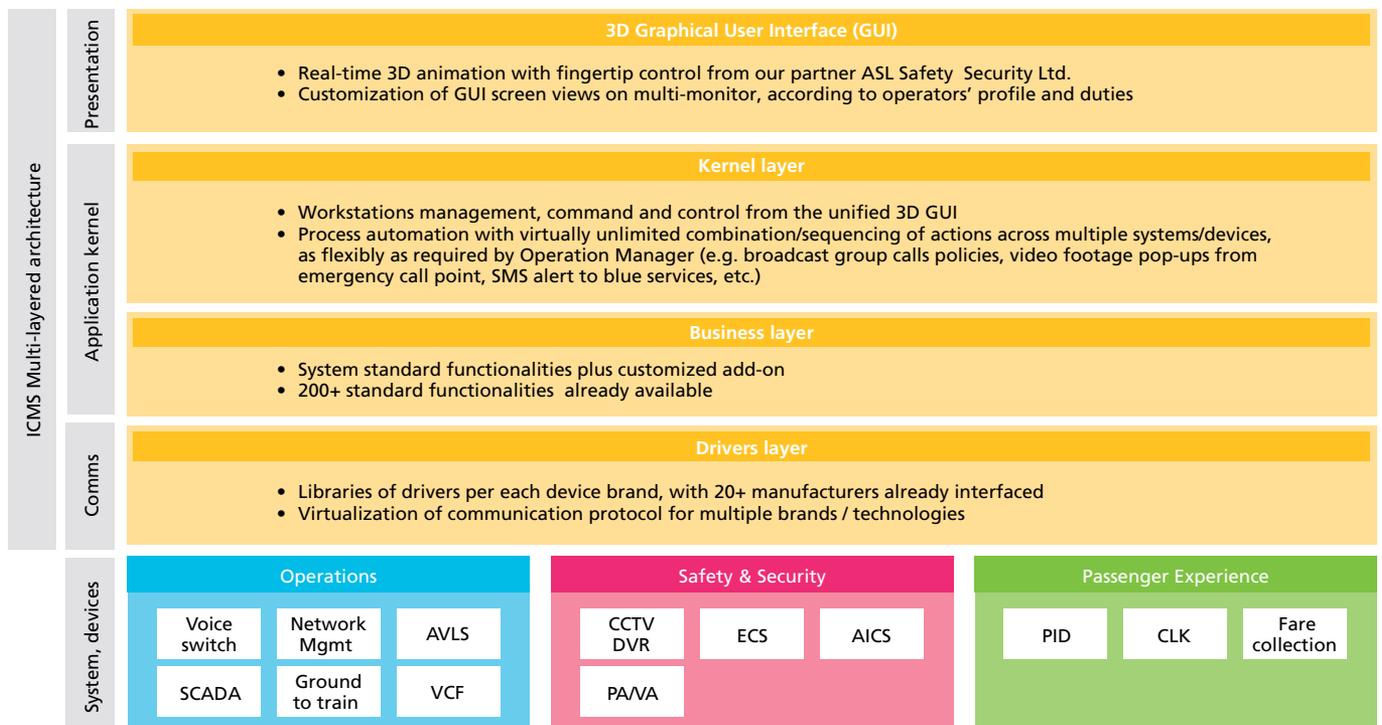
ICMS's tiered client/server architecture ensures peak performance by providing flexibility and load balancing. Its drivers layer features libraries for each device brand and virtualization of communications protocol for multiple technologies. The business layer includes over 200 standard functionalities and allows for customizable add-ons. And the kernel layer features process automation with virtually unlimited combination/sequencing of actions across multiple systems/devices.

The architecture fully supports redundant configurations, maintains an up-to-date representation of the field within its database, and scales to support operations of any size. For specific system technologies, the business layer can be installed on dedicated host servers to control large numbers of devices. Similarly, the kernel layer is installable on multiple host servers to support large numbers of workstations and automations.

## End-to-end efficiency

Blending typical safety-related functionalities with innovative solutions for alarm and problem management, alarm correlation and root cause analysis, trouble ticketing and configuration management, ICMS delivers an efficient, ergonomically effective platform for Control Center staff — keeping your network always-on and riders as safe as possible.

Figure 2. ICMS multi-layered architecture



Ground-To-Train: includes On Board Systems  
VCF: videoconferencing  
AVLS: Automatic Vehicle Location System

CCTV/DVR: Closed-Circuit-TV, Digital Video Recording  
ECS: emergency call system  
AICS: access & intrusion control system

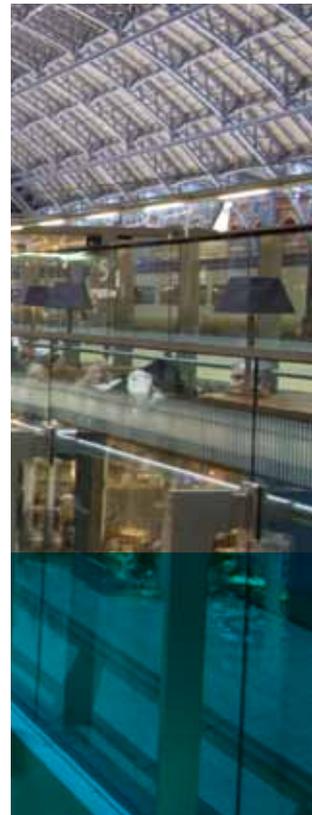
PA/VA: public announcement/voice alarm  
PID: Public Information Displays  
CLK: Clock System



# Partners in innovation

As a global market leader in operations support and business support systems (OSS/BSS), carrier innovation and IT technology, Alcatel-Lucent has helped companies around the world transition to all-IP architectures and infrastructures. The ICMS solution combines our expertise in software integration, network supervision and workflow design and management with a revolutionary 3D graphical user interface based on the iVENCs framework from ASL Safety & Security — Europe's leading provider of solution for public address, voice alarm and associated control systems.

**Contact Alcatel-Lucent today and find out how we can help you evolve your railway safety and security systems to ICMS.**



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