TRAINCOM

Integrated Communication System for Intelligent Train Applications

Contract N°: IST-1999-20096

Key Action: 1 – Systems and services for the citizen
Action Line: 1.1.2-1.6.2 – Systems for intelligent vehicles

Deliverable N°: 4

Project Presentation

www.traincom.org

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Project Co-ordinator: *Mr. Erich Renner - SIEMENS*
Partners:
Adtranz, Adtranz (Italia), Ansaldo, ATOS, CAF, FAR Systems, Firema, Silogic, DB, FS, ÖBB, RENFE, Alstom

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DELIVERABLES SUMMARY SHEET

Project Number: **IST-1999-20096**

Project Acronym: **TRAINCOM**

Title: **Integrated Communication System for Intelligent Train Applications**

Deliverable N°:	4
Due date:	30/04/01
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Short Description

This document provides a brief presentation of the TrainCom project.

History

V 1	first draft	02 Jan 01	TC1-D-EVM-004-01
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Disclaimer

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Partners owning: *SIEMENS (1)*

Partners contributed: *SIEMENS (1)*

Made available to: *All interested people (public deliverable)*

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1. General Information

1.1. List of participants

Partici-pant number	Participant name	Participant short name	Country	Status*
1	SIEMENS Aktiengesellschaft	SIEMENS	D	C
2	DaimlerChrysler Rail Systems GmbH	ADTRANZ	D	P
3	DaimlerChrysler Rail Systems (Italia) S.p.A.	ADTRANZ IT	I	A
4	ANSALDO Trasporti S.p.A.	ATR	I	P
5	ATOS S.p.A.	ATOS	I	A
6	Construcciones y Auxiliar De Ferrocarriles S.A.	CAF	E	P
7	FAR SYSTEMS SpA	FAR	I	P
8	FIREMA Trasporti S.p.A.	FIREMA	I	P
9	SC Silogic srl	SILOGIC	RO	P
10	Deutsche Bahn Reise&Touristik AG	DB	D	P
11	Ferrovie dello Stato Società di Trasporti e Servizi S.p.A.	FS	I	P
12	Österreichische Bundesbahnen	OEBB	A	P
13	Red Nacional de Ferrocarriles Españoles	RENFE	E	P
14	Alstom Transport SA	ALSTOM	F	P

*C = Co-ordinator
P - Principal contractor
A - Assistant contractor

1.2. Project figures

The work takes place with the financial support of the IST Programme of the European Union:

Total cost ( ):	8.023.436
Commission funding ( )	3.799.995
Total effort (pms)	652,6
Duration (months)	36

2. Project Description

2.1. Main goals

The TRAINCOM project intends to fully specify and develop a communication system for telematic applications in the railway field, integrating the on-board network (e. g. TCN), GSM radio links and Internet technologies. Based on this system, which offers ubiquitous remote access to on-board equipment, the proposed project will develop two important applications related to dynamic passenger information and locomotive interoperability, setting up validation sites in different Countries. The project will focus on and contribute to main issues like standardisation and interoperability. A conformance test specification for TCN will be prepared and a suitable automatic testbed developed, so as to favour interoperability of devices and subsystems. Interoperability of applications will be considered in all specifications, which will be proposed for standardisation. An architecture and some basic elements of a maintenance support system, for remote, real-time monitoring of equipment on board trains, will be developed as well.

2.2. Key issues

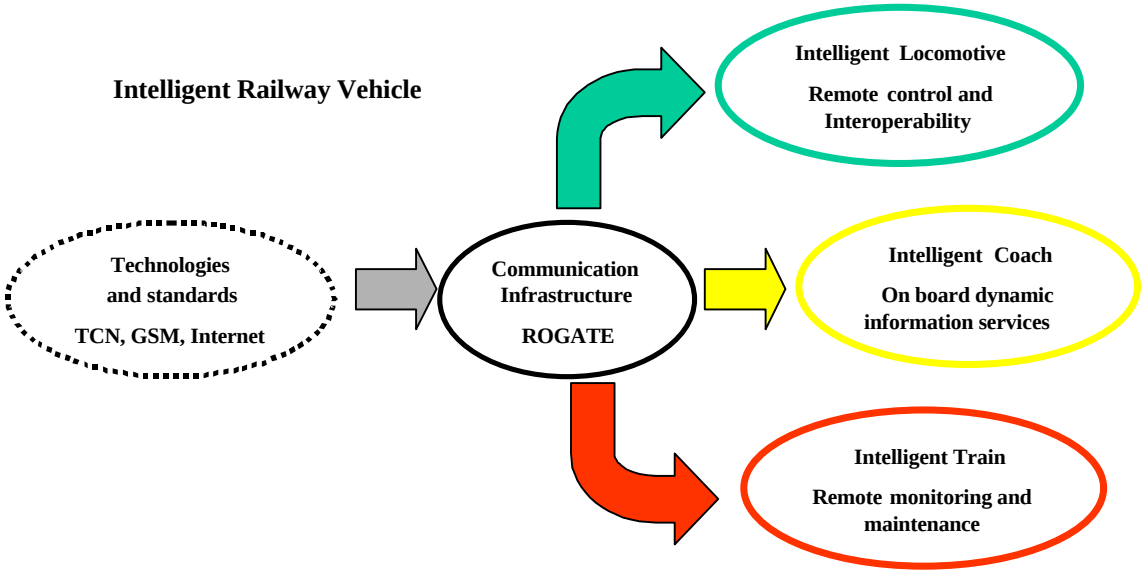
- open and integrate the railway equipment market
- favour the interoperability at train, vehicle and equipment level
- reduce the life cycle cost of railway vehicles
- improve services for citizens and allow new value added services
- make railways more competitive (increase of market share)
- improve comfort of passengers and enhance attractiveness of the public transport
- integrate existing and new technologies (notably Information and Communication Technologies) in railway applications
- enable train fleet maintenance management based on remote monitoring and diagnostics
- pave the way for the establishment of a complete normative platform for railway equipment
- contribute to the next generation of intelligent railway vehicles

2.3. Technical approach

Due to technical and organisational reasons, the proposed project can be divided into 5 fields of activity:

1. Standardisation and Conformance
2. Train-ground Communication Infrastructure (based on ROGATE: Railway Open GATEway)
3. On-board Dynamic Passenger Information System (DPIS)
4. Remote Monitoring and Maintenance (ROMAIN)
5. Locomotives Interoperability

The following block diagram illustrates the relationship between the activity fields:



2.3.1. Standardisation and Conformance

TrainCom starting point is based on existing technologies and standards, like TCN (Train Communication Network), now standard IEC 61375-1, which defines a complete bus solution aboard trains, GSM (or its Railway version, GSM-R) a standard for wireless telephone communication, Internet, which means a wide set of available technologies to build wide area networks.

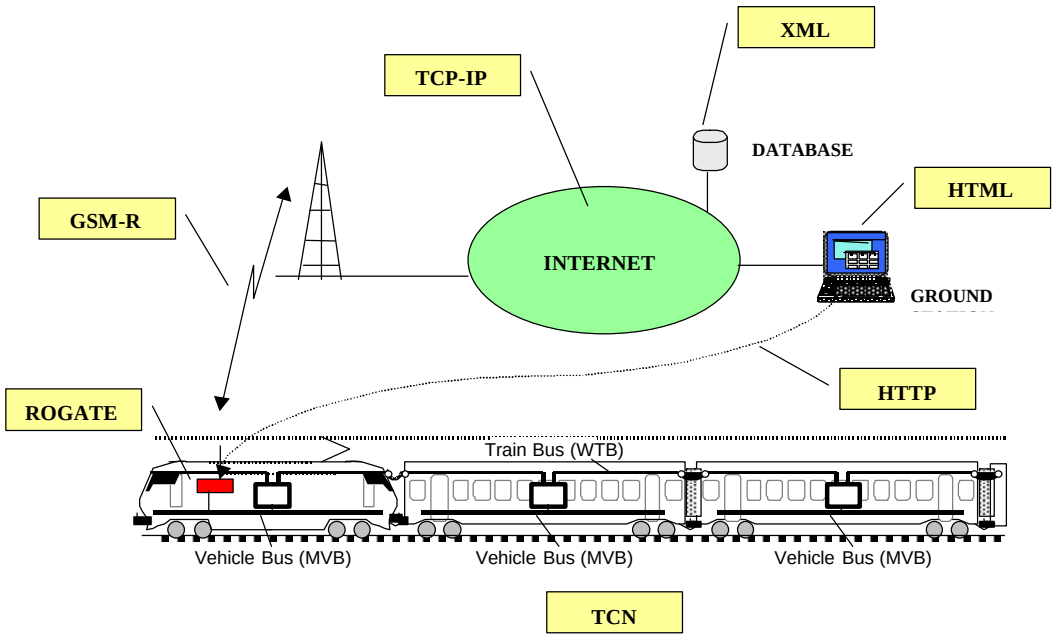
The project will develop a conformance test procedure (to become standard IEC 61375-2) and a suitable testbed for the TCN, allowing easier and quicker compatibility tests for conformity certification of railway equipment.

Traincom will also contribute to establish a normative framework in railways, at European level, to become the reference for a number of applications and products. Specifications at application level will contribute to railway interoperability and standardisation. This normative framework will be the basis for a new generation of intelligent railway vehicles, designed to meet the needs and expectations of European citizens and enterprises.

2.3.2. Train-Ground Communication Infrastructure

TrainCom will develop a reliable train-ground communication system, offering ubiquitous remote access to on-board equipment and integrating available and new technologies:

- the on-board network (TCN or FIP or possibly another on-board bus solution)
- the radio link (based on GSM, or GSM-R, when available) between train and ground
- the higher level protocols and languages of Internet (TCP-IP, HTTP, XML, JAVA and others), for message routing, formatting and delivery
- the needed on-board interface (ROGATE) between TCN and the Internet world
- the ground infrastructure (Communication Servers, Name Servers, Application Servers), to support the needed communication and application services



Integration of different technologies in TrainCom

The resulting infrastructure will become the standard platform on top of which a number of applications can be built, overcoming border line problems and equipment heterogeneity.

2.3.3. On-board Dynamic Passenger Information System

The *dynamic information system for passengers* will handle trip information and seat reservation data, according to a common database structure. Automatic upload of information to trains will reduce time, manpower and errors, improving the quality of service and favouring inter-modal operations as well.

Based on the train-ground communication infrastructure, the service will bring to a new quality level in delivery of information to passengers, both regarding trip information and seat reservation data. Passengers will be informed about destination, route, delay on schedule, platform arrival, connections and so on. Reservation data will be uploaded to the train directly from ground offices, reducing the time limit for reservations before train departure and assuring that updated information are timely available on-board, for passengers to find or check their seats.

The application will be validated through a limited scale demonstration of operation in real service, with data interchange between operators in different countries.

2.3.4. Remote Monitoring and Maintenance

This activity field will specify and develop an architecture and some basic elements of a maintenance support system, for remote, real-time monitoring of equipment directly on-board trains, through the train-ground communication infrastructure. It will pave the way for a trans-European fleet maintenance management, enabling to support rail vehicles wherever they are.

Specific objectives of this application field are:

- accessing train on-board data from remote maintenance centres
- integrating information coming from different sources
- achieving compatibility between trains and maintenance centres
- standardising transmission protocols and formats

The results will steer exploitation intentions of railway operators and manufacturers, possibly starting the development of a complete product, which in the future can be embedded into all new devices and systems aboard trains, allowing for a new, European wide maintenance organisation.

2.3.5. Locomotives Interoperability

Intelligent Locomotives can be remotely controlled according to standard specifications, achieving various levels of interoperability, which is a basic requirement for border crossing rail traffic. TrainCom will focus on loco compatibility at the command and control level, via the Train Bus and according to existing specifications, so contributing in harmonising interfaces related to a specific functionality (traction remote control).

The application will be validated in at least two test sites, using vehicles from different manufacturers. The solution will try to meet railways expectations in terms of reduction of stop time, lower probability of delays and vehicle usage efficiency

2.4. Expected achievements/impact

The main outcomes of the TrainCom project will be:

- Train-Ground Communication System
- New applications for Intelligent Coaches and Locomotives, including dynamic passenger information and remote traction control
- Architecture and basic elements for a trans-European Monitoring and Maintenance Network
- Validation of both existing and new specifications
- Contributions to technical specifications for interoperability and European standard proposals
- Conformance specification and testbed for on-board equipment

The TrainCom project intends to give a strong contribution to the development of an advanced and competitive railway system in Europe, addressing some key problems, like standardisation, interoperability, maintenance support, passenger services and fleet management.

3. Contact details

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