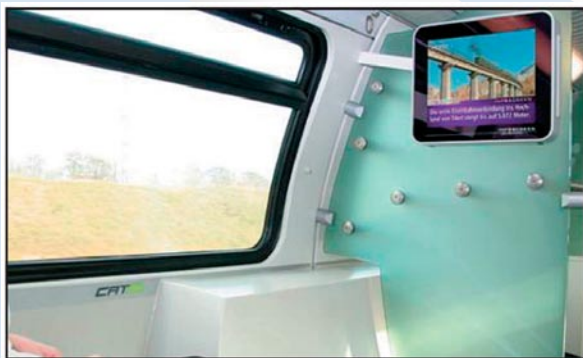


# ► Kontron Solutions@Work

We create digital brains for a more intelligent world

## ► Kontron's Embedded Systems EN50155 Compliant Solutions

Kontron has built up a solid experience within embedded electronics for railways. During these last seven years, Kontron has been involved with the deliveries of embedded computers in the following key projects: AGC (Autorail Grande Capacité), East TGV, Autorail (CFD) and JAVAVAL (automatic train in Lille city) in France. Other projects in the United Kingdom include Virgin's Voyager, Electrostar, Turbostar, Meridian and Pioneer. With this knowledge, Kontron offers solutions based on generic electronic platforms completely EN50155 certified.

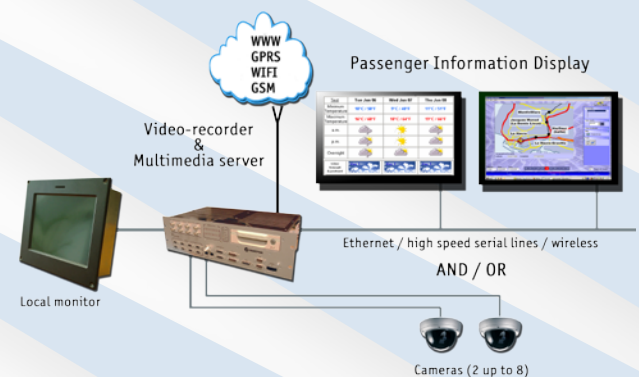


Kontron offers complete turnkey solutions with two partners. Sycube, located in Wien (Austria), offers a software solution for infotainment and fleet management while Pimentic, located in Belfort (France), is specialised in video surveillance software. Kontron, leader in railways embedded system, has decided to combine in

one basic system the possibility to implement one or two of the following options:

### Video surveillance option

Kontron together with Pimentic have developed a Video Surveillance System that allows up to eight cameras to be handled by one system. This cost-effective solution is dedicated to record all the video data into a hard disk. This information can then be analysed for security purposes by removing the portable hard disk. A fully IP Solution with one recorder for a couple of train cars with MPEG4 for the cameras can also be used for retrovision.



### Infotainment System

### Infotainment and Passenger Information Systems option

The partnership between Kontron and Sycube has led to a full system of onboard information for passengers of heavy and light rail. The

solution is fully IP based with intelligent screens supporting the broadcast of general contents such as news, weather, culture, any kind of event and advertising, either locally or globally. Next to that, information about routes, connections, tickets, stops and security are offered to travellers.

### **Train Management System (TMS)**

Based on COTS technology like VME, CompactPCI (cPCI), E<sup>2</sup>Brain, ETX, etc., the TMS acts as the central system of the train and is also a gateway in between several networks like WTB, MVB, LON, CAN, Ethernet and wireless connections offering remote connections with the way-side server. The TMS is the essential system for the driver or train's chief like status and diagnostics of the train's core functions. It is the data media for customers services like seat reservation, passengers information through internet. The TMS is also involved for maintenance, security and fleet management.



**Train Management System**

### **Graphical User Interface (GUI)**

The GUI is the central point of contact to the Train Management System and the driver, which is connected to the train's Ethernet. The visible element is a touch screen at each conductor station – at both ends of every power car – which provides an ergonomic user interface for the conductor and the maintenance personnel. The GUI is designed to be intuitive to use; it also processes information in real time, which allows for rapid decision-making.

Several versions of GUI's are available offering a flexible approach to fulfil the customer's requirements like mechanical dimension custom buttons with back-light through a fibre optic network etc... It could be delivered with Intel or Power PC core CPUs and available with Windows XP, Windows XP embedded, Linux or QNX.



**Graphical User Interface**

### **Remote I/Os**

They are developed to offer an optimized economic solution for I/O's decentralised management on a network like MVB, or Ethernet. In most trains, the topology requests only one Remote I/O per car. Especially for multi-cars fixed unit the usage of Remote I/O offers the possibility to support the train network with MVB which is a much more modular and cheaper solution.



**Remote I/O**

## Railways Environment Requirements

The EN50155 standard for electronic railroad applications places heavy demands on COTS based equipment beyond simply operational characteristics. The standard assumes that electronic systems on trains will need to operate 24 hours a day for 30 years, or approximately 250,000 hours, without failure. This means that train control systems must be designed to withstand the toughest environmental conditions: extended temperature ranges (-40°C up to +85°C), humidity, vibrations and power fluctuations. Even heat build-up and therefore energy absorption have to stay within narrow ranges. Failure-prone fans are prohibited in train electronics and only passive cooling technologies are permitted.

### About Kontron

Kontron is a worldwide leading manufacturer of Embedded Computer Technology and robust mobile solutions. They supply leading OEMs, system integrators and application providers in the most varied market segments such as data and telecommunication, automation technology, metrology and control engineering, transportation, gaming and entertainment, medical and military technology, as well as aeronautical engineering and energy. Our objective is to enable customers to significantly reduce their time-to-market and to provide them with clear competitive advantages with products such as high-performance open computer platforms and systems, single board computers, HMIs and mobile, rugged computers. Kontron employs over 2,300 employees worldwide, with production plants in Europe, North America and the Asia-Pacific region. The company is listed in the German TecDAX 30 under stock exchange code "KBC". Kontron is a member of the Intel® Communications Alliance and therefore receives early access to leading Intel technologies and preferential engineering support. For more detailed information on Kontron, please visit the company website: [www.kontron.com](http://www.kontron.com)

## COTS (Commercial off-the-shelf) Modules

The use of COTS modules for embedded railways solutions offers two major advantages. The first one is economic; as the products are issued from generic standard developments the NRE will be drastically reduced. At the same time, as the COTS production is also based on high volume, it will decrease the recurrent costs as well. The second advantage is that using COTS products based on standard products already in the market like cPCI, VME, ETX, etc. will secure long time availability for the same functionalities. By controlling the full chain of components being parts of the customers dedicated systems or subsystems Kontron is in a very strong position to offer a long term partnership for adapted solution fulfilling your requirements.

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If it's Embedded, it's Kontron.

