ADLINK
Leading EDGE COMPUTING

ETX on the Right Track

Using ETX Modules in Railway Solutions

Ruggedness
Connectivity
Manageability



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Using ETX Modules in Railway Solutions for Ruggedness, Connectivity and Manageability

Introduction

With the increasing deployment of high speed railway systems worldwide and the growing number of users, railcar security monitoring is of paramount importance to improving reliable, safety and comfortable rail travel. Safety monitoring is critical for the rail industry, considering the economic loss, social impact or even casualties that might occur in a train accident or other mishap.

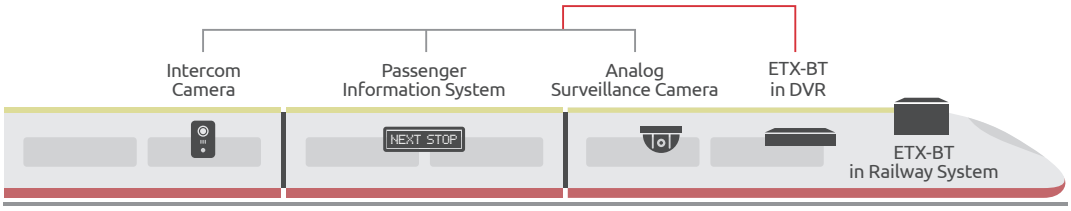
Effective safety monitoring requires the installation of a remote monitoring system to detect and analyze the status of rolling stock and send the information to onboard train operators and an off-site central control room to allow for instant reactions to abnormal situations or safety hazards. Timely data collection and analysis is critical for ensuring the safe arrival of passengers and cargo as scheduled.

ADLINK ETX of computer-on-modules meet the ruggedness, connectivity and manageability needs of today's railway applications.

Secured Railway System with ETX Module on High-Speed Train

Considering the particularities of the operating environment of rolling stock, all devices onboard must be capable of withstanding harsh and constant shock and vibrations and extreme temperatures in widely varying geographic locations. Systems used for rail transport need to be particularly rugged to deliver higher reliability and stability to maintain non-stop operations.

ADLINK's ETX-BT computer-on-module meets IEC 60068-2-64 and IEC-60068-2-27 standards for shock and vibration, and has an operating temperature range of -40°C to 85°C. An example application is a high-speed railway system where each train car is equipped with ETX module-based data acquisition units to collect data from digital cameras, temperature meters, sensors on doors and windows, accelerometers, and signals from wayside devices and other trains. The collected data is then transmitted to an on-board server via secure Control Area Network (CAN) bus communications, and the local server analyzes the data to determine the train status. When any monitored factor reaches a predetermined threshold or a safety hazard is determined, alerts and alarms are issued to allow staff onboard the train or in the control center to take appropriate action.





ADLINK ETX modules offer robust, fault-free connectivity, as well as powerful computing and high-speed I/O to support the broad and growing spectrum of railway systems and related applications.

Stable Connectivity for Data Transmission

ADLINK's ETX-BT module provides two high speed serial buses supporting CAN protocol, an industrial standard developed for internal networking of automotive and other vehicles to deliver a high degree of data consistency with error detection mechanisms. The ETX-BT also provides Gigabit Ethernet via onboard connector to enable fast data transmission.

Onboard locomotive video/audio capture system can leverage ETX's support for rugged embedded designs with higher-performance multicore CPUs for networking, digital signal processing (DSP) and graphics-heavy applications, as well as the specification's generous on-board input/output (I/O) functions that are able to support large data exchange and video data transfer. ETX designs can accommodate both functional and rugged requirements for train systems with dual Ethernet, CRT and flat panel video, multiple serial and USB ports, SATA and IDE interfaces, high-definition audio, and general purpose input/output (GPIO) support.

Being a drop in replacement for older ETX modules, the ETX-BT supports all legacy interfaces of the ETX specification such as dual PATA IDE with Master/Slave, ISA-bus, PCI-bus, serial/parallel ports, Intel-based 10/100Mbps LAN, analog VGA and LVDS. However, it also provides access to new interfaces without the need to modify the carrier board by using low-profile flat cable connectors for Gigabit Ethernet, DDI graphics and XDP CPU debug; as well as onboard connectors for SATA ports and fan power with SmartFan control.



Standing On the Side of Users

Since deployment of a transport system must provide years of serviceability, longevity support and system manageability, expandability and upgradability are key factors that need to be taken into consideration. A built-in board controller that enables real time remote hardware monitoring and diagnostic maintenance is essential for long-term system manageability.

The ETX-BT is equipped with a Smart Embedded Management Agent (SEMA) board controller, the heart of ADLINK's SEMA remote monitoring, control and prevention tool, which provides access to voltage/current monitoring, power sequence debug support, AT/ATX mode control, logistics and forensic information, watchdog timer. SEMA minimizes the need for physical visits by engineers or technicians to perform repairs and maintenance jobs, thus reducing related expenditures.

ADLINK, as one of the most active players in the ETX market, provides continuing support for the form factor by revamping our ETX product range with upgraded performance and new features enabled by the latest technologies. System developers can use any of our new modules as a drop-in replacement to easily upgrade older systems at minimum cost and maximum scalability to extend service life longevity.

ETX Lives On at ADLINK

ADLINK strives to maintain its ETX product offering, so that our customers using ETX-based systems can easily upgrade their systems to a higher performance level at a fraction of the cost and maximize their return on investment. Current users of ETX-based systems who are seeking to prolong the service life of their equipment do not have to modify their carrier board to upgrade their systems. They can simply replace their outdated modules with the ADLINK ETX-BT to gain improved computational power and access to the latest features. With the ETX-BT, customers can revamp their systems with minimum cost and extend product life by at least 10 years.

ETX-BT

ETX Module with Intel Atom® E3800 Series SoC and Celeron® N2930/J1900 Processor

- Up to 4 GB single SODIMM DDR3L at 1333 MHz
- Dual channel 24-bit LVDS, analog VGA
- 2 SATA or 2 PATA (Master only), 4x USB 2.0, 10/100 Mbps LAN (GbE via onboard connector)
- Extreme Rugged operating temperature: -40°C to +85°C (by BOM option)
- Supports Smart Embedded Management Agent (SEMA®) functions

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