ADLINK TECHNOLOGY INC.



Application

ADLINK ETX Modules Used in Train Safety Monitoring System

ADLINK Technology, Inc.

ETX®

intel IoT Solutions Alliance Premier

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Remote Monitoring Solution with Reliability, Scalability and Manageability

With the increasing deployment of high speed transportation systems worldwide and growing numbers using these systems, railcar security monitoring is of paramount importance in improving precision, safety and comfort of 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.

Customer Needs

An onboard train safety monitoring system includes the deployment of a variety of sensors both inside and outside of rail cars system wide to collect safety-related data, including train speed, temperature, the open/closed status of doors and windows, and distance to other trains running on the same track. The sensor data is gathered by a nearby data acquisition unit and forwarded to an onboard server for data processing. The results of data analysis will be immediately displayed on screens installed in the locomotive cab and in the control center for remote monitoring and management.

Challenges

Connectivity

Achieving robust and reliable connections between devices in a real-time monitoring & control system to ensure undisrupted and accurate data transmission to and from the moving and vibrating railway environment is of supreme importance and poses a challenge for engineers or system developers.

Ruggedness

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.

Manageability

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.



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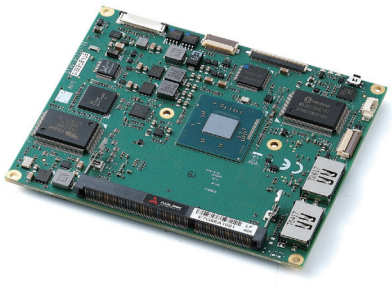
ADLINK Solution

ADLINK's newest series ETX of computer-on-modules is a product that meets the connectivity, ruggedness, manageability, longevity and scalability needs of rail transportation applications.

ADLINK's ETX-BT module provides two high speed serial buses supporting Control Area Network (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 super fast data transmission.

ADLINK, as one of the most active players in 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.

The ETX-BT covers all the legacy functionality of the ETX specification while delivering the newest available features, such as two SATA 3Gb/s ports via onboard connectors and ADLINK's Smart Embedded Management Agent (SEMA) to provide remote monitoring and management. Comprised of a hardware board controller and a software suite, SEMA's remote hardware monitoring and control capabilities allow administrators or engineers in the control center to remotely implement real time management.



ADLINK ETX-BT: ETX Module with Intel® Atom™ Processor E3800 Series SoC

In terms of ruggedness, the ETX-BT meets IEC 60068-2-64 and IEC-60068-2-27 standards for shock and vibration, and has an operating temperature range of -40oC to 85oC.

A typical application scenario is that of China's high-speed rail system, where each train-car is equipped with ADLINK 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 CAN bus communications, and the local server analyzes the data to determine train status. When any monitored factor reaches a pretermined 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.

Conclusion

ADLINK's newest ETX modules deliver all the legacy features of the ETX form factor, as well as the advantages of the latest highspeed interfaces and ADLINK's own technologies. SEMA allows system operators to remotely monitor the hardware and operating status of all onboard units and administer maintenance and repair tasks. This is particularly beneficial in a large transportation system that stretches over an extensive geographical area with many devices installed onboard moving vehicles. ADLINK's SEMA Cloud takes remote manageability step further by pushing data to the user's cloud server via any kind of TCP/IP connection, such as 3G, LAN or wireless LAN. System managers have easy access to data and analytics through a cloud portal, using devices such as desktop PC, tablet or smartphone.

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About ADLINK Technology

ADLINK Technology is enabling the Internet of Things (IoT) with innovative embedded computing solutions for edge devices, intelligent gateways and cloud services. ADLINK's products are application-ready for industrial automation, communications, medical, defense, transportation, and infotainment industries. Our product range includes motherboards, blades, chassis, modules, and systems based on industry standard form factors, as well as an extensive line of test & measurement products and smart touch computers, displays and handhelds that support the global transition to always connected systems. Many products are Extreme Rugged™, supporting extended temperature ranges, shock and vibration.

ADLINK is a Premier Member of the Intel® Internet of Things Solutions Alliance and is active in several standards organizations, including PCI Industrial Computer Manufacturers Group (PICMG), PXI Systems Alliance (PXISA), and Standardization Group for Embedded Technologies (SGeT).

ADLINK is a global company with headquarters in Taiwan and manufacturing in Taiwan and China; R&D and integration in Taiwan, China, the US, and Germany; and an extensive network of worldwide sales and support offices. ADLINK is ISO-9001, ISO-14001, ISO-13485 and TL9000 certified and is publicly traded on the TAIEX Taiwan Stock Exchange (stock code: 6166).

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