AXIOMTEK

Intelligent Surveillance System

In Metro – tBOX Series

Application Story

Axiomtek Intelligent Surveillance System in Metro

Abstract

Along with booming development in urbanization, the trend leads to a new innovated technology in public transportation system. Metro system has significantly become the majority in its development. Nowadays, the trend for transportation electronic devices has been turning into intelligent transportation system, in order to provide highly safety, convenience, and comfortable environment for the passengers. Due to terrorist attack and stabbing spree have risen in recent years, the prevention is needed which forces governments to increase the demand for intelligent surveillance system for transportation sector.

In many circumstances, all the direct evidences will be made through the image that captured from monitoring system in order to verify accountability of accident, crime evident, or to prevent any legal behavior or purposes. Therefore, there are more requirements on the quality and specification of surveillance system, and also the demand to integrate with manageable and intelligent analysis alarm system, which could fully prevent any possible incidents.

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A trend has been emerging that requires each cabinet to install the surveillance security system to protect passenger safety. The system can easily monitor each cabinet's situation and instantly transfer the data to driver's cabinet. When an emergency occurs, the driver can immediately control the situation through monitoring system. Moreover, all the data can be transferred back to central control room through wireless or 3G/4G technology for remote management, which could enhance the overall security protection.

Industry Trend

Public transportation system like Metro has major responsibility to relieve massive traffic for the city, the stability and functional applications are relatively important factors in high cost development of transportation system. In order to carry huge number of daily passengers and to achieve safety and convenience purposes, we must have a complete system design combined with strictly personnel management. However, the demand of safety management is various with complexity, normally it is not just a single unit or system could achieve the entire job. Therefore, the integration for system platform along with railway electromechanical design has become a major task.

Infrastructure Features

Wenhu line of Taipei MRT (Massive Rapid Transit) is one kind of unmanned system and there are total four cabinets in one train and its design concept is each cabinet installed with two IP cameras, in connection with monitor, emergency braking system, emergency intercom, and smoke detector.

Through this complete infrastructure design, the passenger could efficiently ask for the help to control center by using the emergency intercom whenever an accident occurs.

When passengers press the intercom button, the monitoring system could know its location, and immediately transfer the data back to control center, so the staff are able to monitor the situation in each cabinet in real-time solution and take proper actions. The control center will perform daily routine testing for passenger intercom and line broadcasting, to ensure the system is running in normal operation.

An integrated surveillance & security system design for rail cabinet has become a mandatory task. The data or image monitoring system, door emergency open/close control, fisheye lens, wide-angle or hidden camera are all required electronic devices on the cabinet, to ensure passengers' safety from possible incidents. In addition, with the images stored inside of DVR system, all the data from cabinet, access control system, and train information could be sent back through wireless technology to Operating Control

Center (OCC), or Station Control Room (SCR), or Passenger Agent Office (PAO) for train stop location and access control monitoring. Figure 1. Shows the structure of the surveillance system.

System Requirements

1. Powerful computing performance and fanless design

2. Wide acceptable power range to handle onboard power limitations

3. Isolated and fixable I/O port provides stability and system protections

4. The ability to integrate with other electronic devices in the MRT

5. Anti-vibration and anti-shock capability for rugged embedded computer

6. Required transportation certification for rolling stock

Figure 1. Intelligent Security Surveillance System in MRT

System Design Features

Powerful computing performance, Rugged and Flexible tBOX series makes Axiomtek become your most reliable partner in intelligent transportation solutions.

- ### tBOX810-838-FL

Axiomtek tBOX810-838-FL is a fanless embedded box PC certified with eMark, ISO7637, EN50155, EN50121 and IEC60945 for a variety of transportation applications. The tBOX810-838-FL is powered by the Intel® Atom™ processor E3845 quad-core 1.91GHz or Intel® Atom™ processor E3827 dual-core 1.75 GHz with onboard DDR3L memory up to 4GB. Additionally, it has high integration ability with two full-size PCI Express Mini Card slots and one SIM card which makes it a multi-function professional embedded device for transportation applications. The tBOX810-838-FL could meet the diverse needs of transportation industry, such as in-vehicle, rolling stock and marine market. Measuring only 164 x 108 x 44 mm and 0.77kg, the mini fanless embedded system supports a wide operating temperature ranging from -40°C to +70°C as well as 9 ~ 36V wide DC input for wide range of harsh environmental conditions. It is definitely the top choice for M2M intelligent system for railway, marine, and in-vehicle solutions.

- ### tBOX323-835-FL

The tBOX323-835-FL, a fanless railway PC, is designed for in-train applications. Integrated with onboard quad-core Intel® Atom™ E3845 processor and 4 GB low-powered DDR3L memory. The fanless railway PC boosts its computing performance and specializes its I/O design with five isolated COM ports, two M12-type LAN connectors, USB 2.0 ports, and one isolated digital I/O. The railway PC also provides VGA and HDMI outputs for in-train surveillance. The tBOX323-835-FL is an ideal all-in-one IoT (Internet of

Things) solution for various applications, including railway multi-functions of gateway, controller, digital signage management and surveillance. Certificated with EN50155 and EN50121 for rolling stock and complied with EN45545-2 for fire resistance, the rugged embedded system operates reliably in a -40ºC to 70ºC operating temperature range (EN50155 Class TX) and in a high vibration environment.

◼ tBOX322-882-FL

The tBOX322-882-FL fanless railway embedded PC is based on 4th/5th generation Intel® Core™ i7 or i3 processor with wide temperature capability from -40°C to +70°C. Certified with EN50155, EN50121 and complied with the standard of railway vehicles fire protection – PrCEN TS 45545-2, the railway PC is well suited for IoT & M2M-related applications such as onboard devices controller, train management, gateway, security surveillance and rolling stock environments. To keep all cables tightly secured, the railway pc has standard M12 connectors for Ethernet ports, USB ports, power input, and audio port. What is notable is that the graphics performance is now merely up to two times higher than previous generation, with the latest quad core processor, allowing faster and better information display.

About Axiomtek Co., Ltd.

Axiomtek Co. Ltd. is one of the world's leading designers/manufacturers of PC-based industrial computer products. From our roots as a turnkey systems integrator specializing in data acquisition and control systems, Axiomtek has mirrored the PC evolution in various industries by shifting our focus toward the design and manufacture of PC-based industrial automation solutions.

Axiomtek Co., Ltd. established in 1990, has more than 60 distributor partners globally. Axiomtek offers Industrial PCs (IPC), Single Board Computers and System on Modules (slot CPU card, small form factor embedded boards & SoM), Fanless & Rugged Embedded System (eBOX and rBOX), Intelligent Transportation Embedded System (tBOX), Industrial IoT Gateway & Industrial Firewall, Touch Panel Computers (TPC), Medical PCs (MPC), Human-Machine Interface (HMI), Digital Signage and Players (DS), Industrial Network and Network

Communication Appliances (NA).

As an associate member of the Intel® Internet of Things Solutions Alliance, Axiomtek continuously develops and delivers cutting edge solutions based on the latest Intel® platforms.

To learn more about how our Design-in Services or motherboards can support your application needs, visit us at www.axiomtek.com, or email us at info@axiomtek.com.tw.

Axiomtek's ATP website: http://atp.axiomtek.com.tw/atp/.
Axiomtek's global website: www.axiomtek.com.