

Intel® Core™ i7 COM Platform for Gaming Machines

Introduction

With the increasing popularity of gaming machines and gambling in general, there are now more than 4,000 casinos worldwide. Slot machines are the most popular casino gaming devices, and account for about 70 percent of the average casino's income. These machines, known variously as slots, video poker, or fruit machines, offer people a chance to participate in gaming entertainment with a very modest investment, with the lure of possible payouts. These advanced gaming machines employ touch panels, revolutionary 3-D graphics and high-definition video.



Application Requirements

A premier developer of electronic casino amusements was searching for a COM Express Type II CPU module to power its new line of next-generation gaming machines. An important requirement was for the COM module to be able to seamlessly integrate with the developer's custom carrier board design. After thorough analysis of the gaming machine's demanding technical specifications, Advantech engineers selected the SOM-5788 (with Intel® Core™ i7 processor) for the project.

Solutions

Hardware

Advantech SOM-5788 features 8 GB of DDR3 (1066 MHz) in addition to VGA, LVDS, HDMI support and HD audio output. The Intel® Core™ i7 chip architecture enables graphics processing directly within its processing core, as opposed to on a separate chip. Boasting 1.5 times greater graphical performance than that of a GM45 platform, the i7 based SOM-5788 would significantly boost the slot machines' performance – a feat not possible with an older, more traditional 3-chip COM configuration.

Software Integration

Advantech's Software API & Utilities enabled the developer to write applications for hardware control quickly and easily, without having to know all the technical details of the chipset or driver architecture. The API library was diverse enough to allow the developer's engineers to control everything from system throttling to the CPU's clock speed.

Benefits

- Next-generation low-power, high-performance Intel® Core™ i7 processor based solution.
- Skilled application engineers and product support.
- Advantech's long-term commitment and guaranteed technical support.



Ruggedized Solutions for Locomotive Communications

Introduction

These days most railways and trains are powered by electricity rather than fossil fuels but the underlying technology remains largely unchanged—and that technology is getting much more sophisticated, designed to improve overall efficiency, safety, speed and comfort. And even after all this time, railways are again becoming an important part of an integrated transport policy as they offer huge energy and efficiency savings, as well as significant environmental benefits over all other modes of transport.



Application Requirements

One particular customer in the railroad industry was looking for a special type of reliable industrial-grade computer. Advantech's PCM-3353 module was chosen for its powerful ruggedized features and integrated with state-of-the-art wireless technologies to meet their requirements.

- -20 to +80° C operating temperature for integration into outdoor heavy plant and equipment subject to extreme operating wide-temperature conditions.
- PC/104 form factor to keep in line with previous generation chassis and I/O modules and for high vibration resistance.
- High graphic capability to drive LCD displays, and extensibility to add additional PC/104 modules to the stack.
- Wireless capability for real-time fuel consumption status.

Solutions

Hardware

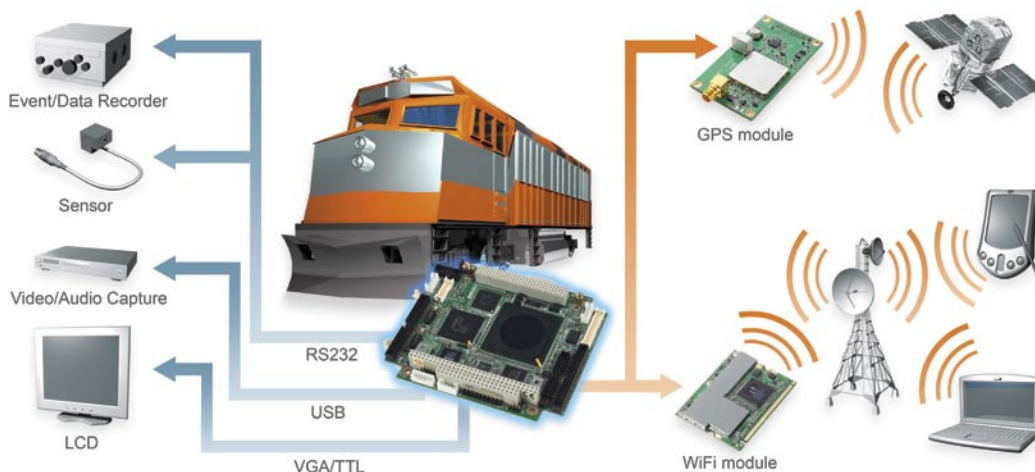
The project used 2 x RS232, 1 x RS232/422/485, USB, and LAN from PCM-3353's onboard I/O in order to connect with external systems such as engine controllers, data recorders and sensors, and video/audio capture devices. Additionally, this application was augmented with a rugged LCD monitor. Expansion options were available through GPS, GSM/GPRS, CDMA, WiFi, and 802.11a/b/g and integrated through the PC/104-plus connector. I/O connectors on the application were of heavy duty industrial grade which are water-proof once connected.

Software Integration

The customer used a HW monitor (Advantech's SUSI API library) to inspect temperature and voltage information, and used the Watchdog Timer to perform specific checks to test if things go wrong so the system can recover on its own.

Benefits

- Efficient I/O connectivity to fulfill a wide variety of applications.
- Highly reliable in extreme vibration and wide temperature environments.
- Reduced maintenance.
- Low power consumption and energy savings.



Unique Integration Features for a Railway Display System

Introduction

With thousands of tons of heavy rolling stock at stake, engine driver information systems play a crucial role in ensuring safety. Display hardware and software are constantly evolving to meet the requirements for new functions as the needs of railway transportation develop. A railway equipment system integrator in China needed a display system solution for locomotive operators. Trains often run through tunnels suddenly emerging into bright daylight which causes the ambient light in the locomotive cab to change dramatically. An auto-adjusting display keeps critical information available to the locomotive operator at all times.



Application Requirements

The customer identified four major requirements for the locomotive display system:

- **Human Machine Interface:** Must include a super reliable, super readable display with a touch screen, PS/2 input, and audio capability.
- **Display Controller:** Must process all incoming data, generating a real time visual display with audio. Must have instant, automatic brightness adjustment to deal with sudden major changes in light level (either bright-to-dark, or dark-to-bright), and must be controllable via a touch screen and PS/2 input.
- **Information Module:** Must communicate with display controller, and back-up USB module.
- **System Maintenance Module:** Must auto-detect and maintain a log of display system status, including any failures, and must be capable of generating daily reports.

Solutions

Hardware

The 5.25" SBC PCM-9588 was selected as the display controller. Its features include: PS/2 input module, VGA card and audio, RS/232/485, and RS4/22 interfaces, LAN and support for PC/104-Plus expansion. Additionally, it supports both LVDS and TTL output and a SATA/IDE/CF interface. The low profile PCM-9588 was a great fit for the information display system.

Software Integration

Advantech provides software services that meet specific customer requirements and lower design complexity. For example, we can downsize Windows CE images based on customer requirements; the size can be reduced to below 50 MB to achieve the best performance for small CompactFlash disks.

Benefits

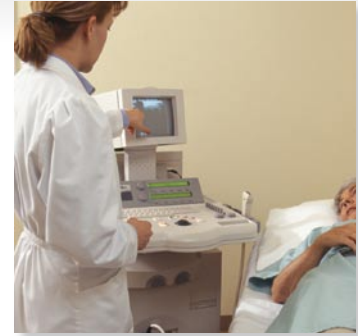
- LVDS provides excellent EMI shielding, low power consumption, and long cable runs.
- A CF card assures high stability, even when faced with the vibrations of a moving train.
- On-board RS/422 connects to an existing train information bus.



High Connectivity Platform for Medical Ultrasound Machines

Introduction

Ultrasound has been used to image the human body for at least 50 years, and is one of the most widely used diagnostic tools in modern medicine. One particular customer in the medical industry was looking for a special type of reliable industrial-grade computer. By studying hospital employees it was found that their workloads were large, their working conditions varied, and their equipment was old. Equipment failure rates were high so a stable reliable solution was sought. Product support and reliability were important, as were medical grade features. Advantech's AIMB-210 was chosen as a powerful and reliable computing platform. The customer needed its rich I/O connectivity and performance to control other devices in their application.



Application Requirements

Medical professionals require instruments that handle functions with total stability, but also need to be connected to the medical IT infrastructure. Achieving these two objectives within a realistic size, weight, power, and cost envelope requires a special hardware platform. Medical instruments are getting smaller in size, and we are gradually seeing more compact and portable Ultrasound instruments coming onto the market. The hardware platform needs to be powerful, reliable and compact as they are in constant operation.

Solutions

Hardware

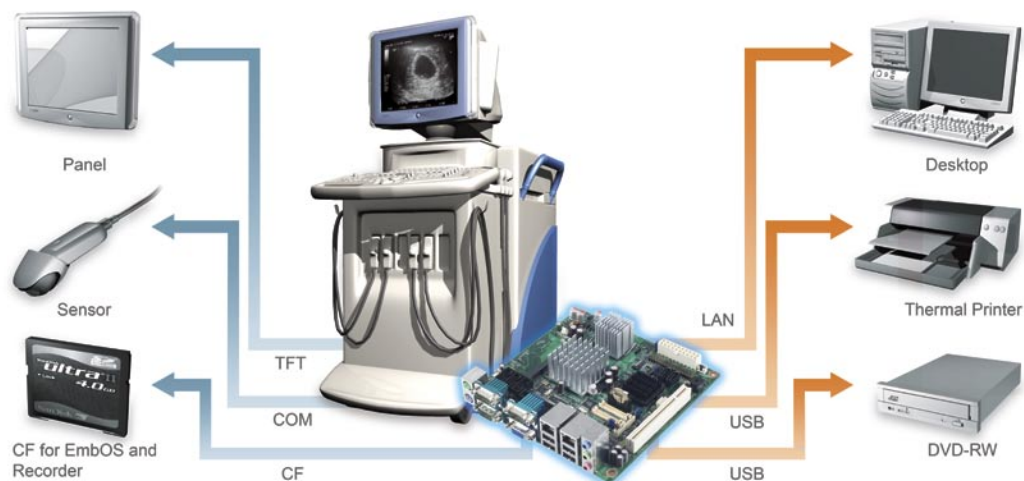
The project I/O required 2 x RS-232, PCI, TV-out, USB, and LAN from AIMB-210's onboard I/O in order to connect with external systems and devices such as data recorders, probes, sensors, video/audio displays, and storage devices.

Software Integration

The customer used XPe OS to implement a quick power on function so it directly links to their own medical applications. Using Advantech's software API & utilities they were able to easily integrate their own application software. They utilized the HW monitor utility to inspect temperature and voltage information, and configure the GPIO. Finally, they customized the BIOS to display the hospital logo when it powered up.

Benefits

- Flexible and rich I/O connectivity.
- Highly reliable and cost efficient with product longevity support.
- Reduced maintenance and cost.
- Low power consumption and energy savings.



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