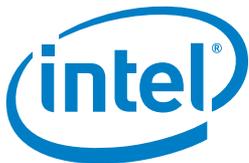


Advantech Puts Intel Architecture at the Heart of LiDCO's Advanced Cardiovascular Monitoring System



"Strong partners like Advantech and Intel help LiDCO to bring innovative medical products using well understood technology into the healthcare market with the optimum combination of high performance and low cost."

- Eric Mills, Product Development Manager, LiDCO

Summary

The drive to reform healthcare systems and control healthcare expenditures is challenging Medical Device OEMs to respond to increasing cost pressures.

While more innovation with newer features is being demanded, innovation on its own is no longer enough to triumph over the competition between medical technologies specialists. Today it is becoming more and more important to ensure that one can also implement cost optimized solutions so that more units can be deployed across more hospitals which lead to a far greater increase in efficiency and effectiveness for the healthcare sector.

The LiDCOrapid system developed by LiDCO is one such solution. It is a unique game changing minimally invasive hemodynamic monitoring system which utilizes commercially available technology from Advantech to reduce development costs and improve the key time to market metric.

Solution

Advantech is a leading provider of medical grade panel PCs to the healthcare market. They provide a wide and versatile range of medical grade computing platforms which can fit almost any hospital setting ranging from space confined Operating Rooms to Critical Care nursing stations. All of Advantech's medical platforms cater to the distinctive requirements of electronic products within a hospital setting along with conforming to all medical related technology standards such as ISO-13485, EN60601-1 and UL60601-1.

Introduction

LiDCO Group Plc develops and produces medical devices within the cardiovascular monitoring field that enable healthcare providers to treat critical care and cardiovascular high risk hospital patients while undergoing major surgery or cardiology procedures.

LiDCO's current products are the LiDCOplus system which is a calibrated hemodynamic monitor used predominantly in the intensive care unit and the LiDCOrapid system which is a smaller, easier to use hemodynamic monitor for the OR and other acute situations. Both of these products use the patented and validated PulseCO algorithm to provide a range of data concerning the performance of a patient's heart and blood circulation.

LiDCOrapid System

Hemodynamic monitoring is one of the main diagnostic tools available today in the acute care setting. It is used to diagnose cardiovascular deficiency and monitor changes over time in response to interventions by physicians. Hemodynamic monitors essentially measure cardiac output and today there are a number of different approaches available which vary in relation to the nature of their invasiveness. The solutions vary from simple non invasive techniques to more invasive ones.

The LiDCOrapid system is a minimally invasive hemodynamic monitoring system which is capable of measuring cardiac output on a beat by beat basis. This system monitors the arterial blood pressure waveform along with the corresponding beat durations and from this it determines the amount of blood that is pumped out with each individual beat and heart rate.

This system is aimed at providing feedback to a physician on the patient's fluid and hemodynamic status. It is the first monitor designed purposely to assist in the hemodynamic management of patients undergoing major surgery. The system consists of a POC 125 terminal and a data acquisition module. The arterial blood pressure waveform is converted to digital form by the data acquisition module which in essence gives a digitized blood pressure value and this data is then transferred over the PCI bus to the POC125 for further analysis. The final output provides close monitoring of blood pressure, stroke volume, heart rate, and continuous cardiac output.

WHY CHOOSE ADVANTECH?

LiDCO decided early in the product development process to use Advantech's Point of Care terminals rather than develop their own customized terminal. There were a number of reasons that tilted the scale in favour of using proven Advantech technology.

1. The POC terminal is already certified to the EN60601-1 standard.
2. The touch screen and enclosure can be cleaned with medical / surgical grade cleaning agents which is a critically important requirement for a LiDCO hemodynamic monitoring device which is used in Intensive Care Units and operating rooms hospital based environments.
3. PCI expansion is available to accommodate the external data acquisition cards.
4. Wanted to ensure that the POC-125 would remain available unchanged for as long as possible.
5. Reduced time to market with lower design risk.
6. Allowed LiDCO to concentrate fully on their core competencies.

Advantech initially supplied a true medical grade panel PC to LiDCO. However over time Advantech's new product introductions have allowed customers like LiDCO to differentiate their product offerings in relation to the structure and architecture of the Advantech POC product family. For example a special smart card reader was integrated into the POC125 to enable LiDCO to offer their customers a fee for use service model. Essentially this smart key allows customers access to use the LiDCO system at the lowest cost. This model gives LiDCO the chance to deliver their technology at the lowest possible cost to hospitals but it also ensures that hospitals can keep capital expenditures low and pay for use of the LiDCO product on a fee for use basis.

Today LiDCO has added the POC125 to the POC155 (which is used on their LiDCOplus product) which is a more compact design featuring a 12.1" TFT color LCD touch screen which is an ideal fit for space constrained Operating Rooms where this product is typically used.

The low audible noise of the POC-125 makes it an ideal point-of-care solution for patients and hospital practitioners.



Advantech POC-125 Medical Terminal

The POC-125 is a medical multimedia Panel Computer which is based on the Intel® Pentium® mobile processor and is devised to function as a Point of Care terminal (POC). It is UL60601-1/EN60601-1 compliant (certifies electronic radiation prevention) and is designed to withstand a harsh patient care environment (IPX1 and IP65/NEMA4 certify water and dust resistance).



Fig 1: Advantech POC-125

The POC-125 comes with a 12.1" color TFT LCD display, on-board PCI Ethernet controller, dual COM port interfaces, built in 2.5" HDD drive and a 16-bit stereo audio controller. It is an ideal point-of-care solution for patients and hospital practitioners due to its low audible noise.

Also it is specially designed to resist spills and water damage, and ensures dust resistance with its protected LCD, sealed ports and card slots. This is an important requirement for a hospital environment where spills are a daily occurrence and there is the need to reduce the risk of infection by ensuring contaminant free surfaces.

Advantech POC-155 Medical Terminal

The POC-155 is a Point of Care terminal that is based on the Intel® Pentium® M Processor. It is UL60601-1/EN60601-1 approved and has a 15" display. The POC-155 is constructed specifically to withstand spills and water damage and is designed with a protected LCD, sealed ports and card slots which help to protect against dust. Also it is a safe solution for patients and healthcare staff alike due to its low-current-leakage power supply.

In summary Advantech provide a diverse range of touch screen-equipped POCs, built to prevent electronic emissions, with a choice of configurations and screen sizes ranging from 10 to 22 inches diagonally. They resist spills and water damage, and keep out dust via sealed LCDs and enclosures. Fanless design facilitates easy cleaning and silent operation. In general POCs are used across a range of medical settings and furthermore they can also be utilized for barcode scanning, viewing of patient records and use of medical software.

WHY INTEL?

Intel over the last number of years has expanded the reach of its embedded products deeply into the embedded market with innovative new processor platforms which lead the way in terms of performance and power consumption. Intel has a comprehensive range of products on the embedded roadmap from the power efficient Intel® Atom™ processor which has a Thermal Design Power (TDP) of less than 5 watts to the quad core Intel® Xeon® processor family which can match a range of customer requirements and fit into a variety of embedded applications within the medical segment.

Outside of providing ground breaking processor platforms Intel Embedded Group also ensures the long term availability of any product on its embedded roadmaps. Intel's embedded processors have long product life cycles of up to 7 years and this is a prerequisite for the medical equipment market.

Furthermore Intel provides strong technical and marketing support to customers like Advantech during their system design phase which ensures faster time to market for Advantech and their end customers.

Today proven Intel embedded processors including Intel® Celeron M Processor, Intel® Pentium M Processor and Intel® Core™ 2 Duo Processor are just some of the processors used in Advantech's line of Point of Care Terminals.

LIDCO Rapid

Fluid management just got easier

"We offer a comprehensive range of medical Point of Care terminals which are all based on Intel® Architecture, adhere to all medical industry standards and help our customers to considerably reduce system development time and effort."

- Mike Fay, Key Account Manager,
Advantech



Hemodynamic Monitor for Anaesthesia and ICU

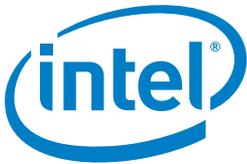
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