



CUSTOMER:

IBASE Technology Inc.

INDUSTRY:

Medical electronic devices

CHALLENGES:

Develop a dual-purpose, easy-to-use, bedside information terminal for use in hospital patient care that could replace a variety of other hospital systems while improving patient and medical staff satisfaction.

SOLUTION:

Built around the AMD Embedded G-Series T56N Accelerated Processing Unit (APU), the IBASE bedside medical information terminal features powerful processing and intensive graphics capabilities muscle to handle myriad uses and applications.

RESULTS:

The IBASE BST-1850 serves patients and medical staff seamlessly.

AMD TECHNOLOGY AT A GLANCE:

AMD Embedded G-Series APU

Graphics-Intensive Bedside Medical Information Terminals

Devices replace a variety of other hospital systems, provide patients with infotainment options, and give medical staff access to records and more

IBASE was approached by a customer who required a bedside terminal for use in hospital patient care, which would offer both “infotainment” options for patients and data access for medical staff. The result was a dual-purpose machine used for patient information and video on demand that replaces a variety of other hospital systems.

The initial order was for a lower-budget unit designed for a specific purpose, but IBASE expanded on the initial device, resulting in a multi-touch bedside terminal called the BST-1850 that is currently in use in three hospitals in Japan and Spain, with more than 1,000 units sold.

The bedside information terminal is practical and powerful because it’s built atop the 1.6GHz, AMD Embedded G-Series T56N APU. It has processing and graphics muscle and can handle a variety of uses and applications – from patients who want to do online gaming to physicians who want to examine a video replay or 3D scenography. IBASE said the AMD APU had better thermal performance than competing solutions that were considered, and it was available at the price/performance IBASE needed for the application.

“The bedside information terminal is practical and powerful. We built it atop the 1.6GHz, AMD Embedded G-Series T56N APU to give the terminal both processing and graphics muscle so that it can handle myriad uses and applications. The AMD APU had better thermal performance than competing solutions we looked at, and it offered the correct price/performance we needed for this application.”

Jackson Mao, Product Planning Division Director, IBASE Technology

At IBASE, the development process was focused on the notion that the BST-1850 must serve two equally important types of users.

For patients, the BST-1850 was designed to be used for watching television and movies, surfing the Internet, gaming, placing orders at the hospital shop, making phone calls, choosing meals, accessing email, paying hospital bills and viewing hospital information such as facilities guides.

The medical staff puts the device to use in other ways, such as for viewing the patient's electronic health records and monitoring vital signs. They also can use it as an input-and-review device for the treatment regimen. The system can be set up so that it will alert staff to a patient's specialized dietary needs quickly, so they can review orders from the physician, and more. The goal is that the BST-1850 will lessen the burden on doctors and nurses.

Because it is used for viewing all kinds of information, the system includes a projective, capacitive multifunctional, slim, LCD (16:9) 18.5" touchscreen (1366 x 768) with a front-panel ingress protection (IP) rating of IP65. The unit operates on a 12VDC power supply and the monitor weighs less than 10 pounds. The separate main body weighs about 5.5 pounds and has built-in cellphone-level functionality as well as a 16GB solid-state drive (SSD) and 2GB DDR3-1066 memory.

The bedside medical information terminal supports many different input/output devices, such as Web cameras, 2W + 2W speakers, IC card readers, 2D barcode readers and RFID readers. Interfaces include Bluetooth, IEEE802.11 n b/g standard wireless LAN, two LAN interfaces, four USB 2.0 ports (two on the main system box and two on the terminal), two SATA 2.0 interfaces, one audio-in port and two audio-out ports. It operates between 32 and 104 degrees Fahrenheit, and can be stored in temperatures ranging from -4 to 176 degrees Fahrenheit. The unit can withstand humidity up to 90% at 104 degrees Fahrenheit.

The unit also was designed with local-area network and wireless connectivity support, so there can be two-way transfer of real-time information between the terminal and the nursing station or other hospital areas. Physical integration between the terminal and the hospital's existing medical software typically is handled by the hospital's service provider or IT staff.

The system is expandable for options including fingerprint scanners, IP phones or other peripherals. For instance, a built-in webcam (with a privacy shutter) can facilitate physician communication via Skype between different divisions in hospitals or small clinics or with the patient's family members.

IBASE says the BST-1850 can be purchased as a replacement for about a dozen other hospital systems, such as:

- IC card readers used for accessing patient information, and through which nurses and doctors log in and check in,
- barcode readers, used for accessing patient information,
- fingerprint authenticators, used for security and identification purposes,
- medical touch panels,
- patient bedside record-keeping devices,
- cameras with network connectivity for bedside real-time monitoring,
- emergency handsets for call communications,
- emergency call buttons,
- television displays,
- stereo speakers, and
- microphones for hands-free communication.

The unit's design is one of its greatest differentiators: Unlike other medical bedside terminals, the BST-1850 is not an all-in-one design. The bedside terminal's 10-point multi-touch panel can be placed on a table or in a cantilever position on a swivel arm. The unit's separate system box is secured to the wall, which allowed IBASE to keep the bedside unit small. The screen and wall unit are connected via a customized cable that can convey low-voltage differential signaling (LVDS), USB, power, and control signals.

The unique design also limits the weight of the unit: the display terminal weighs less than half as much as all-in-one systems, making it easier to move around. With malfunctioning medical devices considered one of the leading causes of serious injury and death in the United States between 2006 and 2011, and with 23% of the recalls reported due to computer-related failures¹, IBASE determined that having the system divided into two separate pieces made more sense than creating an all-in-one unit.

The unit secured to the wall handles the processing power and is not jostled or carried around, thereby protecting the hardware. The unit was designed to meet UL-60601-1 safety regulations.

IBASE considered the safety requirements needed in a healthcare setting when designing BST-1850. For instance, the system's touchscreen is made to be easily disinfected and cleaned to keep it medically sterile. The plastics used in building the system are certified anti-bacterial and dustproof, as well as resistant to chemical and alcohol wipes. For privacy considerations, the webcam includes a mechanical shutter that a patient, nurse or doctor can close for privacy. The camera can be disabled altogether as well.

The overall dimensions of the terminal are approximately 18" x 14" x 1.4", while the main body is approximately 5" x 12" x 2.4".

The BST-1850 multi-touch bedside terminal recently was awarded the 2013 Taiwan Excellence Award².

ABOUT IBASE TECHNOLOGY

Founded in 2000, IBASE Technology (TASDAQ: 8050) is an ISO 9001 and ISO 13485 certified company that specializes in the design and manufacturing of industrial PC products. IBASE provides OEM/ODM services tailoring products to customers' requirements. Current product offerings from IBASE include various single-board computers, Mini-ITX boards, Disk-Size SBC, ETX CPU modules, embedded systems and network appliances for various applications in the automation, digital signage, gaming and entertainment, medical, military and networking markets.

IBASE is committed to delivering innovative, practical and dependable solutions for an ever-evolving industrial computing landscape. For more information, please visit www.ibase-usa.com.

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¹ Source: IEEE Security & Privacy, "Analysis of Safety-Critical Computer Failures in Medical Devices," July-Aug. 2013 (Vol. 11, No. 4), by Homayoun Alemzadeh et al.

² Source: <http://www.taiwanexcellence.org/index.php/awards/AWB2013/page/3/1/23/1/541/3/3/>

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