

## Motherboards

# Motherboards Deliver Long-Life Availability

**Long-life-availability motherboards promise to match product life cycles, reduce field support, and lower the total cost of ownership.**

By Todd Shanar, ITOX Applied Computing

**H**ow does one define obsolete in the ever-changing embedded-computing-technology industry? If an engineer is using a standard off-the-shelf motherboard in an embedded application, the product is in jeopardy of being obsolete every 18 to 24 months. This lifespan is typical for most commercial motherboards. Beyond that lifespan, availability and support become compromised. Despite ongoing technological advancements, most computer-based solution manufacturers cannot afford to continually upgrade their products. It's simply too costly. In addition, it often creates compatibility issues with customer applications.

Think about it. How is life-cycle cost affected when a manufacturer must reconfigure the production of existing products every 18 months to two years? What additional testing must be performed to ensure that upgrades don't negatively impact already installed hardware and software? In addition, what's the cost in man-hours and time related to re-engineering, testing, and re-certification (see the Figure)?

For many industries--especially those representing the gaming, medical, military, and banking fields--stiff regulations further complicate these processes. They govern the upgrade or reconfiguration of all key computer components including motherboards. These complications are magnified even more by the angst of customers, who must sit and await the

arrival of their products throughout the entire process.

For many industries, the accessibility of motherboards that offer long-term availability provides greater stability to the ongoing production of existing computer-based solutions. At the same time, it reduces product life-cycle costs. Now, companies working within the embedded computing field don't have to rely on products that become unavailable in 18 months with little notice. Instead, they can depend on standard and custom-designed boards that are guaranteed to be available for three to five years or even longer.

In the past few years, long-life products have advanced to meet a wide breadth of embedded-industry needs. Ranging in form factors from ATX through Mini-ITX, these motherboards are now based on Intel Embedded Roadmap components. They are designed as high-quality, modular, standards-based building blocks. In addition, the boards are designed to meet a wide range of customer requirements. Typically, they include features like the following: legacy ISA; PCI and PCI-X slots; PCI Express bus support; CompactFlash; GPIO; multiple Gigabit LAN ports; and support for LVDS digital flat-panel-display interface.

As a result, companies have eagerly embraced long-life-availability motherboards for their ability to:

- Allow engineering resources to stay focused on value-added components rather than the underlying platform
- Facilitate smooth product transitions during revision changes and board replacement by providing advance notice of these events
- Over the past decade, DTx Inc. has been just one of the many companies that benefited greatly from the introduction of long-life-availability motherboards. Headquartered in Melbourne, Florida, DTx specializes in embedded-computing solutions for the medical device industry. From blood analysis and medical imaging equipment to patient monitoring, DTx supports many medical OEMs. The company offers integrated solutions that define new technologies, achieve performance standards, extend life cycles, and meet cost targets.
- By controlling the rapid technological changes that can jeopardize regulatory certifications, DTx better supports its customers. It delivers stable, managed computing solutions with greatly extended life cycles. "Unlike mass-produced technology like cell phones or personal computers, medical-device makers must adhere to strict regulatory requirements," says Phillip Gerard, the company's Executive Vice President of Sales and Marketing. "Our overall goal is to provide predictability in an unstable environment by managing the impact of changing technologies."
- Reduce certification, re-engineering, and testing costs

## Motherboards

"Since a key ingredient in this process is successful supply-chain and life-cycle management, the long-term availability of components—including motherboards—is important. Our design process can last two years. The certified products are expected to perform error-free with minimal changes for the next five to seven years. Given this mission, revisions to any component can prove extremely costly and time consuming due to the possible need for additional engineering support, product testing, upgrades, compliance testing, and re-certification."



Here is a depiction of the product life cycle.

According to Gerard, the ability to forecast product roadmaps through the use of long-life-availability motherboards is a major benefit. "Because extended-life motherboards are available for a minimum of three to five years and revision and EOL announcements are made at least six months before occurring, product strategies can be gauged well in advance."

Bob Canning, a Systems Engineer at Inter-Tel Inc. for the past nine years, agrees with Gerard on the benefits offered by long-life-availability motherboards. His company also relies on embedded-computing technologies that resist change.

Based in Tempe, Arizona, Inter-Tel offers voice and data communications solutions for customers ranging from large enterprises to small, medium, and residential home-based businesses. In addition, the company specializes in the design and scalable deployment of network communications solutions. These solutions enable customers to grow and adapt business-communications portfolios as their needs change and new technologies evolve. Most importantly, Inter-Tel is dedicated to providing long-term telephony software applications that improve processes by merging organizational departments and resources into one single, cohesive unit.

"Because we develop business telecommunications solutions that are scalable to a customer's growing needs, we are dependent on components that offer long-lasting availability," says Canning. "Change is costly and not conducive to customer satisfaction, as upgrades commonly include downtime and the need to re-orient businesses to new user protocols. Unfortunately, change also means additional product-validation testing and training for our field staff."

"That's why we choose our embedded-component suppliers so carefully. We need partners that will deliver the same quality-controlled product time and time again. In addition, scalability is a leading selling point for our company. Our customers need to know that the product they buy from us today will be readily upgradeable with minimal effort and expense for the next seven to ten years. We couldn't possibly meet that demand with embedded products, such as motherboards, that frequently eliminate products within two years of their introduction."

### Design, Manufacturing, And Revision

Most long-life-availability motherboards are designed with embedded Intel® Architecture chipsets and processors. This ensures five-year availability of these critical parts from Intel. To introduce new products that can be applied for at least three to five years in a customer's product, the manufacturers of long-life-availability motherboards must keep their design, test, and manufacture cycles as short as possible. Because of this accelerated process, it's imperative that strict quality-control and testing measures be utilized throughout every phase of the development, design, and manufacturing process. This includes design-verification testing to ensure functional, application, and environmental performance. In addition, targeted customers should test beta units in their applications.

The manufacturers that utilize their own manufacturing facilities for volume-production requirements realize additional benefits. They have full control in allocating these resources during the critical phase-in of new products and phase-out of older products that have reached end-of-life (EOL). This advantage is especially important when scheduling the production of large, last-time-buy orders for an EOL'd product.

To facilitate the long-life-availability process, manufacturers try to utilize the same supporting components across their entire product lines. These components are carefully chosen based on their long-term availability, ability to meet specific performance criteria, and the track record and relationship established with the component manufacturer. By using the same components across as many product lines as possible, the volume of usage is maximized. In the unlikely event that one or more of these components is discontinued, the manufacturer can justify and better afford a large last-