



Case Study

Intel® Core™ i7 and Intel® Celeron® Mobile Processors

Mobile Intel® QM57 Express Chipset

Intel® Solid State Drive
Tablet PC Systems

Formidable Computing Environments, Meet Formidable Technology

Xplore relies on Intel® embedded solutions to develop a rugged new tablet PC with the performance and stability to satisfy its most demanding customers



Xplore has just released its iX104 C5* rugged tablet computer based on embedded Intel® architecture and certified to MIL-STANDARD-810G for harsh environments.

Overview

At Xplore Technologies Corp., business as usual means dealing with some very tough customers. Tough, because they want computers that can withstand exposure to shock, dust, water, mud, extreme temperatures, and constant vibration. Tough, because they want computers that can be bumped, knocked, struck, or even dropped from four feet onto a concrete slab. And still work, of course.

Headquartered in Austin, Texas, Xplore is a leading developer of rugged mobile wireless computing systems for harsh environments. Xplore's durable tablet PCs are engineered to perform on the front lines in work settings that aren't suited to traditional mobile computing solutions. The company's products are targeted to mobile professionals in sectors such as field services, manufacturing, warehousing, public safety, the military, transportation, and utilities, where the tablets operate as mobile devices or in docking stations in vehicles, forklifts, or rolling carts.

Xplore recognizes that its customers need mobile computing tools that match tough on-the-job requirements, whether those jobs take them deep underground, high above power lines, or out in the trenches. For this reason, Xplore insists on leading-edge technologies such as the Intel® Core™ processor family that can be trusted to deliver performance and stability.

Xplore recently took advantage of Intel® processors, chipsets, solid-state drives, and wireless solutions to develop its new iX104 C5* tablet, an integrated computing system for the long product lifecycles that customers demand. Besides maintaining Xplore's reputation for ruggedness, portability, ease of use, and performance, the iX104 C5 raises the bar in the fast-growing tablet marketplace by supporting robust data protection and best-in-class display and thermal solutions.

According to Xplore, running on Intel® silicon is a must for hardware manufacturers in the rugged mobility space – both for the scalable technology benefits that engineers appreciate and the time-to-market benefits that business people appreciate.

The Challenge: Long Life, Harsh Environments

Xplore Technologies was founded in 1996 to develop a new breed of rugged tablet PCs for vertical markets. With the recent advent of consumer-oriented devices such as the Apple iPad*, companies have become increasingly interested in the tablet PC form factor as a general-purpose computing device for line-of-business applications. Xplore sees this as a sign that the tablet PC industry is poised for rapid growth.

A Tough Standard for Tough Conditions

Xplore's iX104 C5* rugged tablet computer is designed, tested, and certified to MIL-STD-810G for use in harsh environments. Officially known as the Department of Defense Test Method Standard for Environmental Engineering Considerations and Laboratory Tests, the MIL-STD-810G standard was created specifically for DoD applications but can be tailored for commercial applications.

The environmental management and engineering processes described within MIL-STD-810G have considerable value to device manufacturers, given that compliance with the standard generates confidence in the environmental worthiness and overall durability of a system design. The tests associated with MIL-STD-810G cover a wide range of environmental factors, including high and low temperatures, exposure to the elements, vehicular vibration, transit shock, and repetitive dropping – all of which occur naturally in the field.

For Xplore, adhering to MIL-STD-810G criteria ensures that the mobile computing tools users receive match their job requirements, whether a tablet PC ends up in a military transport vehicle, a mine, or a police car. More to the point, the lessons learned from developing products to military standards can be applied to Xplore solutions designed for commercial applications, thereby assuring durable products that field workers will come to trust and use on a daily basis, leading to improved business workflow.

The advantages are clear: Paper-based methods of data collection are time-consuming and leave room for error, both as field personnel gather the data and as data entry clerks translate it into corporate databases. Xplore has found that customers using front-line systems at the point of transaction instead of paper experience an average 22 percent increase in error reduction and productivity gains of as much as 400 percent – enabling better real-time decision-making while making a strong case for ROI.

Xplore's product development is driven by the need for rugged, lightweight, and easy-to-use tablet PCs that mobile workers can trust to perform. The company's iX series has a track record of breaking ground in rugged tablet PC development, from integrated mobile broadband to optically engineered LCDs to multimodal input. Developers sought to continue this evolution but faced some key design and engineering challenges.

"One of our most critical challenges is meeting the long product lifecycles expected by our customers," says Michael Garel, Senior Development Manager at Xplore. "We have to carefully select and design for a minimum life cycle requirement of three years."

Another key design challenge involves creating tools that users can truly rely on in formidable environments. For example, as customers move increasingly to conducting business in the field, system uptime and data integrity become imperative. In addition, customers need tablet computers with great outdoor viewability and solutions that can withstand sand, dust, and temperature extremes. These requirements drove Xplore to develop a powerful new rugged tablet PC based on the latest technology, with best-in-class data protection, display, and thermal solutions.

"Our customers understand the advantages of Intel® platforms and demand the use of Intel components in our products."

*– Michael Garel, Senior Development Manager,
Xplore Technologies Corp.*

The Solution: Integrated Intel® Technologies

Xplore customers require a high degree of stability and performance because they rely heavily on their mobile computing tools. To meet those requirements, product developers integrate Intel® technology wherever possible.

"Our customers understand the advantages of Intel® platforms and demand the use of Intel components in our products," Garel says. "To survive in the rugged mobility space, a hardware manufacturer needs to be running on Intel silicon."

Xplore's new iX104 C5 platform is based on embedded Intel processors to support scalable performance. For high-end applications like GIS mapping that require real-time capabilities and fast

processing to render images, the iX104 C5 runs on the latest Intel® Core™ i7-620UE mobile processor with Intel® Turbo Boost Technology.¹ For customers whose resource requirements are lighter – for example, applications designed for Internet-based computing – the iX104 C5 offers the cost-effective performance of the Intel® Celeron® mobile processor U3405.

The C5 platform integrates the Mobile Intel® QM57 Express chipset and uses the chipset's on-board RAID controller in combination with Intel® Matrix Storage Manager software to provide users with the most rugged data protection possible. The new tablet PC also features the speed and performance of dual Intel® X18-M Mainstream SATA Solid-State Drives, which users can RAID-configure to help ensure zero downtime.

"Data protection is of paramount importance to field workers in remote locations who might capture data for weeks at a time before they communicate that data back to host systems," explains Garel. "The RAID array and stability and performance of Intel® Solid State Drive (Intel® SSD) technology gives customers peace of mind in the event of a drive failure."

The C5 tablet is also engineered to take advantage of Intel® vPro™ technology capabilities, including virtualization and trusted execution technology. For security against lost or stolen equipment, the C5 uses the Intel® Anti-Theft Technology² that comes with the Mobile Intel QM57 Express chipset.

"The ability to develop platforms with key components that are fully integrated is a huge advantage for us," Garel says. "Integration of Intel processors, chipsets, SSDs and wireless solutions provides a high level of confidence in the technology platform that is consistent with our customers' performance and compatibility specifications."

To enhance viewability in work settings that can span from bright sunlight to ambient lighting, Xplore engineered a custom dual-mode AllVue* Xtreme display that provides customers with a highly viewable and rugged LCD screen. Garel says the graphics controller integrated in the same package as the CPU plays a big part in the new optical display solution because it provides the horsepower needed to render and present information quickly for users.

Xplore developers took further advantage of Intel technology to address the design challenges of a thermal solution. "Our latest industrial thermal management system combined with the ultra-low-voltage Intel Core i7-620UE processors allows our iX104 C5 tablet to operate in some of the worst conditions," Garel says.

Benefits That Last Over a Long, Harsh Life

For Xplore, the ability to deliver integrated solutions for the three- to five-year product lifecycles that customers require is one of the most valuable benefits of using Intel components. Working close with Intel, Xplore gains solid visibility into Intel's embedded technology roadmap, enabling it to select Intel® products supported with a longer lifespan suited for the markets Xplore serves.

Customers Speak Out

"The iX104 C5 demonstrates a commitment to leveraging the latest technology to provide a product that can both build on the successes of the current-generation platform as well as provide the latitude needed to meet the future needs of our customers."

- Leslie Jaffray, VP Sales, Filbiron

"The iX104 has been reliable and durable in the field, and the field service representatives depend on it to perform their daily tasks. The systems have improved the speed and accuracy of inspections and meter sets, enabling our field service representatives to streamline their data collection and reporting procedures."

- David Stair, Field Services Manager, Huntsville Utilities

Moreover, many of Xplore's customers have large deployments that extend over long periods of time, and they don't want mid-stream changes that could affect things like image builds or product integration. By actively working these sorts of issues out with Intel, Xplore can assure its customers that all the units they receive will be the same, even if customers go a year between product deliveries.

Xplore works very closely with Intel on upcoming products, giving it a distinct advantage in terms of streamlining development and bringing new products to market quickly. "The support that Intel provides for early documentation, schematic and layout reviews, and early silicon has allowed us to develop and launch our rugged tablet ahead of our competition," says Garel.

He notes that using embedded Intel® architecture shortens Xplore's product development cycle by a full third. "Having access to both a full library of technical data and direct engagement with Intel engineers, we've gone from 18 months to 12 with the current product," Garel says.

Once Xplore products reach the market, the benefits of choosing Intel technology extend to customers.

"High reliability and low failure rates mean more uptime on the job, and enhanced durability means users don't have to worry about their computer systems while doing work," says Garel. "For companies and their IT staff, this means improved cost structures and higher ROI for field projects, coupled with the stability, performance, and ease of management that come from Intel architecture."

For More Information

edc.intel.com/platforms/playbooks/Core

edc.intel.com/Intel-Product-Technologies

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Solution provided by:



¹ Intel® Turbo Boost Technology requires a platform with a processor with Intel Turbo Boost Technology capability. Intel Turbo Boost Technology performance varies depending on hardware, software and overall system configuration. Check with your platform manufacturer on whether your system delivers Intel Turbo Boost Technology. For more information, see www.intel.com/technology/turboboost.

² No computer system can provide absolute security under all conditions. Intel® Anti-Theft Technology (Intel® AT) (also referred to as the 'poison pill' in some documents) requires the computer system to have an Intel AT-enabled chipset, BIOS, firmware release, software and an Intel AT-capable service provider/ISV application and service subscription. Intel AT performs the encrypted data access disable by preventing access to or deleting cryptographic material (e.g. encryption keys) required to access previously encrypted data. ISV-provided Intel AT-capable encryption software may store this cryptographic material in the PC's chipset. In order to restore access to data when the system is recovered, this cryptographic material must be escrowed/backed up in advance in a separate device or server provided by the security ISV/service provider. The detection (triggers), response (actions), and recovery mechanisms only work after the Intel AT functionality has been activated and configured. The activation process requires an enrollment procedure in order to obtain a license from an authorized security vendor/service provider for each PC or batch of PCs. Activation also requires setup and configuration by the purchaser or service provider and may require scripting with the console. Certain functionality may not be offered by some ISVs or service providers. Certain functionality may not be available in all countries. Intel assumes no liability for lost or stolen data and/or systems or any other damages resulting thereof.

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