Industrial-Grade Kiosk Computers: The Brains Behind Today's Interactive Kiosk Experiences

Consolidation of product SKUs into one powerful modular chassis design streamlines self-service kiosk production, maintenance and expansion

The Challenge

- Effectively partner in developing and deploying more than 50,000 next-generation kiosk machine computers to drive kiosk applications in several lines of business
- Efficiently connect with proven provider of kiosk-based engineering and design expertise, able to manufacture at scale
- Consolidate multiple SKUs resulting from deployment of various computer chassis designs customized for each line of business
- Ensure a smart, modular design that protects computer longevity while reducing material lead time and higher than necessary inventory levels
- Deliver unmatched peripheral access and performance, with significant USB resources designed into each kiosk computer
- Increase focus on remote management for service, system updates and relocation of kiosks as needed

The Solution

- Modular, flexible industrial design purpose-built for kiosk computing compliant to all applicable industry regulations and standards
- Scale mass deployment with one modular kiosk computer SKU across the kiosk manufacturer organization and its lines of business
- Common chassis supported by rear I/O module enabling application-specific performance
- Extensive USB resources to accommodate varied peripherals necessary to kiosk computer features such as payment readers, fingerprint scanners, cameras, and more
- Sustain existing architecture's need for specific RJ45 serial ports
- Accessible, washable dust filters and removable hard drives aligned with streamlined kiosk service strategies
- Trusted Platform Module security protocols, meeting PCI DSS requirements and personal privacy standards for Europe and North America with data purge at close of each transaction
- Smart physical security features inherent to application design, including system pause on access by technicians
- Performance and longevity prioritized, integrating Intel 6th Generation CORE processors with extended embedded availability

The Benefit

- Create a long-term foundation for mission-critical kiosk computing, with kiosk computers purpose-built for longevity, flexibility and reliability
- Easily maintain operations with streamlined SKU that reduces material lead time, keeps inventory levels in check, and minimizes service logistics and costs
- Tap into Premio's effective, hands-on supply chain management that sustains massive kiosk deployment worldwide
- Remain positioned for leadership and growth with flexible, cost-effective kiosk computers that enable fast prototyping for new applications

The Company

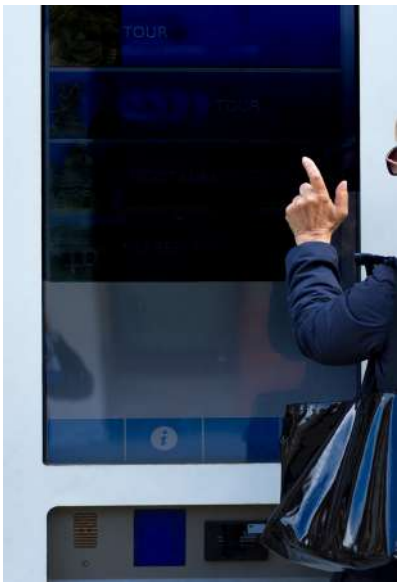
Today's self-service, standalone kiosks are a far cry from vending machines of years gone by. These intelligent, fully-automatic retail 'stores' offer products and services without the checkout clerk. Their very nature provides on-the-go, yet at-your-own-pace, convenience for a range of consumers. Whether renting movies, cashing out spare change or recycling used mobile devices, kiosks have gained popularity for their ready access, ease of use and intuitive interfaces.

One automated retail company with three distinct lines of business presents services via more than 50,000 kiosks located in heavily trafficked environments such as grocery stores, convenience stores, fast food restaurants, mass retailers and pharmacies. The company's typical self-service vending kiosk combines an interactive touch screen and signage. Additional elements — like robotic disk array systems, intelligent cameras, credit card readers, ID verification software and web-linked electronic communications — provide the inner workings. But it is the brains behind the self-service kiosks' immersive instructiveness (a.k.a., the industrial-grade kiosk computer) that brings it all together for this kiosk manufacturer.

The Challenge

With three distinct brands capitalizing on the self-service kiosk market, this company faced growing consumer demand for its popular services. For years, each line of business worked separately with Premio to gain the advantage in its respective market. Premio designed all the kiosk computers for their interactive kiosks using industrial grade materials with ultra-compact chassis form factors and a universal mounting mechanism. These specialty computers had been purpose built with many common kiosk-friendly features such as single-sided I/O and power controls, tool-less access for services, easy-swappable hard disk trays and washable dust filters. But because these projects were developed independently over time to meet brand-specific requirements, each of this company's kiosk computers had its own unique chassis design which could not be shared across the other brands.

This resulted in multiple production SKUs – an approach that meant higher than acceptable inventory levels and often extended material lead time. It also impinged on timely service and increased regulatory compliance costs. And it did not provide the flexibility the kiosk manufacturer needed for speedy prototyping of new ventures – an ongoing objective to growing the overall business. To sustain and expand operations for the long term, it would be necessary to consolidate the kiosk computer design under a single common SKU. This would allow the organization to gain efficiencies across the enterprise by taking advantage of economies of scale.



KIOSK MACHINES OFFER EXPEDITED SELF-SERVICE TASKS AND ARE DEPLOYABLE IN MANY ON-THE-GO MARKET SEGMENTS THAT RANGE FROM RETAIL, SMART CITIES, RESTAURANT (QSR), BANK, PUBLIC TRANSIT, AND HOSPITALS.

Having worked closely with this kiosk manufacturer for 20-plus years, Premio has the type of long-standing relationship that fostered a great deal of trust and collaboration. In deploying these kiosk computers over time, technology advancements enabled more and more capabilities within kiosks. One element fueling performance is the USB port, which connects a high-speed peripheral to the kiosk computer. Given today's multi-featured self-service kiosks, the more USB ports the better. While integration of 12 to 14 USB connections (or more) is no easy feat, Premio had grown accustomed to this request and devised a method for the industrial-grade kiosk computer to accommodate a growing number of USB ports. It would be imperative that this new single SKU design also enable USB port expansion, allowing the kiosk computer to make the most of new innovations as they became available.

Over time and many product generations, Premio's expert observations and guidance also led to integration of smaller, faster and more reliable components, significantly impacting the design of each subsequent kiosk computer. Adjustments made to each iteration focused on incremental improvements and efficiencies. The move to a single SKU must not jeopardize this forward progress.

Ultra-Compact, Cost-Effective, And Low-Power Consumption

The minimalistic design approach is created to keep the most essential I/O for IoT gateways and low-power embedded computing. These industrial kiosk machine computers offer a small foot print design that aims for optimal space conservation and ease of deployment in many self-service kiosk use cases.

Rich I/O Options For Workload Consolidation

Kiosk machine computer offer rich I/O features including USB, COM, Gigabit LAN, DVI-I and digital I/O ports that cater to a wide range of industrial, embedded and edge computing deployments often required in remote kiosk machines. These kiosk machine computers offer a modular designs that provides I/O flexibility and IoT scalability.

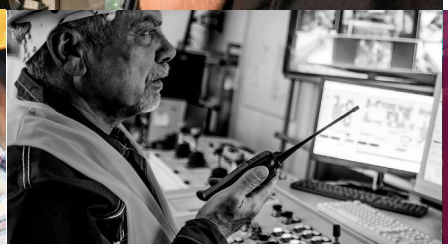
The Solution

To streamline kiosk design among the three brands without compromising prior advances, Premio proposed a small form factor, modular chassis approach for all kiosk computers offered by the automated retail company. Modular kiosk computer design aims to maximize common part sharing at a range of different computing levels. Kiosk computers are defined by a common chassis design with additional application-specific add-on I/O modules. These enable scalability, performance and features, and can be shared across or easily converted into all existing, and even future, production SKUs.

Premio's new modular design focuses on three mechanical aspects: rear I/O module, universal dust filter locking, and universal mounting kit. Taking this tack supports sharing of a common system barebone (mainly chassis and power supply) across the different brands while modulating the application-specific I/Os into standard swappable modules. Dedicated to meeting the computing demands of the various kiosk applications, Premio's turnkey engineering team developed a custom I/O module design specific to each brand. The kiosk computers strategic and COTS-based design can now be shared across all three lines of business, tapping into hot swappable modules seamlessly allowing customized I/O or performance attributes.

Premio's multipurpose design also recognizes that kiosk computers must accommodate the mechanical limitations of different kiosks. Common features such as dust filters — crucial in managing the dirt and particulates routinely found in kiosk settings — must not only be accessible but also flexible in their placement within the kiosk enclosure. Premio's design takes a proactive approach to ensuring access and serviceability, featuring an omnidirectional mounting system allowing easy reorienting of the filter as warranted. Mechanical conversion is minor and requires no changes to the Bill of Materials for the SKU's chassis. A universal chassis mounting kit was also developed as part of the design itself, creating a readymade kit matched to the mechanical dimensions of each kiosk and its unique requirements for sliding rails and tool-less locking.

Premio's solution also considers both data security and functional security of the systems at work. For example, operational security is programmed into the kiosk computer. When an authorized technician opens the kiosk door, the kiosk computer stops; its door lock communicates with the PC's comm port and pauses all programs until the door lock is re-engaged in its secure and closed position.



In addition to the functional and physical security of the kiosk, Premio's kiosk computer secures data according to PCI DSS regulations. Windows 10 IoT encryption software is mandated, ensuring the most sophisticated encryption programming available. Computer hardware also incorporates state-of-the-art security protocols, tapping into Trusted Platform Module protection built into the architecture to prevent any data compromise or computer manipulation. The kiosk manufacturer's security protocols are considered at the earliest phase of design and adapted as needed for the end-use application. A crucial advantage is also built into the customer application, purging all personally identifiable information at the close of each transaction. These features consider the global nature of the kiosk manufacturer's footprint, accommodating personal privacy and data controls among the most stringent and varied across North America and Europe.

Premio also ensured a highly competitive quotation aligned with its smart modular kiosk design. Powered by the latest Intel® 6th Gen Core Processors, these kiosk computer configurations ensure a minimum three-year product lifecycle. The kiosk manufacturer reduces its total cost of ownership with the latest computing technology at a competitive price, as well as significant business operational savings across all its lines of business.

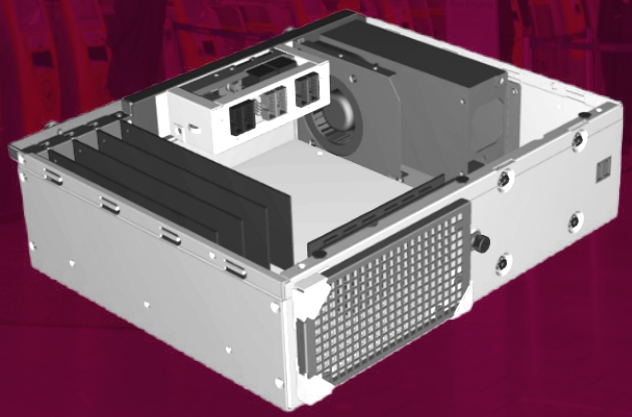
The Benefit

By including a distinct I/O board, in addition to a traditional motherboard, Premio's kiosk computer ensures ultimate flexibility for the kiosk manufacturer and its various lines of business. Extensive I/O options enable access to significant USB resources, accommodating the extensive type and number of peripherals that can be found in any given kiosk. This also allows the kiosk computer to maintain specific serial ports as RJ45 to accommodate the manufacturer's existing and proprietary architecture. All I/O is fully compliant to a range of regulations and standards such as FCC, CE and UL, in accordance with the needs of this global kiosk provider. Smart design keeps all connections facing one side, allowing technicians to visualize and service the computer without removal from the kiosk. Remote connectivity ensures easy updates, with each kiosk equipped with 3G/4G connection to the cloud. With a unique ID number assigned to each kiosk, computers are monitored at will and in real time. In the event of a kiosk needing to be moved from one physical location to another, password credentials can be updated remotely to allow a moving team access and further secure the kiosk once it is established in its new location – all without a technician required onsite.

In addition to considering system longevity and long-term access to processor performance, this smart modular design takes a proactive approach to keeping in check inventory levels and material lead time. For example, the consistent chassis foundation minimizes cable routing modifications inside the kiosk with better backward compatibility, therefore reducing long-term service costs and logistics. A tool-less focus furthers this value – everything is designed to 'pop out' and keep simplicity as a central theme. The kiosk is unlocked with a thumbscrew, dust filters are easily accessible and washable, hard drives are easily removable without disturbing the PC itself. And the flexible I/O module is based on exactly what the kiosk requires, ensuring fast manufacturing at scale.

"Turn Computing Ideas Into Reality"
ODM Customization

KIOSK MACHINE MANUFACTURES WORK EXTREMELY CLOSE WITH EMBEDDED COMPUTING EXPERTS TO DESIGN RELIABLE INDUSTRIAL-GRADE COMPUTERS AT MASSIVE SCALE. THIS PROCESS PROVIDES A COMPLETELY CUSTOM DESIGN THAT ENSURES MISSION-CRITICAL KIOSK APPLICATIONS CAN BE DEPLOYED IN RUGGED AND OUTDOOR ENVIRONMENTS.



When pursuing future ventures, agile prototyping for proof of concept requires only the design of the application-specific I/O modules to meet the functional requirements. With minor cost additions on customized I/O modules, the advantages of modular kiosk computer design will be exponential as demand continues to grow.

In taking a modular design approach, Premio has enabled this kiosk giant to streamline its kiosk computing engine to a single SKU. With extended I/O options based on the application and deployment, the kiosk manufacturer can now quickly scale and go to market, catering to all the unique peripherals inside the box. This adds critical value as kiosk computing must accommodate a large number of peripherals. As IoT sensors capture and process data, high-speed USB peripherals are the pathway to interacting with that data. Cameras, cash registers, fingerprint scanners, readers for payment cards or identification documents – these all require USB connections, often 20 or more in a single kiosk computer.

Throughout this lasting partnership, Premio has provided the technical acumen and practical guidance to build and improve these kiosk computers along the way. With a reliable computing engine roadmap, the ability to scale has never been in question. Now, with a single SKU, that ability is streamlined, allowing the organization to focus on what it does best: build and deploy innovative self-service kiosks to meet consumer demands and exceed expectations.

CERTIFIED ISO 9001 CERTIFIED ISO 13485 CERTIFIED ISO 14001

premio
918 Radecki Court, City of Industry, CA 91748
Main : 626-839-3100 I Fax : 626-839-3111
www.premioinc.com

We Design, Manufacture, and Service customers around the world

Fanless Mini Computer

BCO-1000
Basic Fanless System ideal for space-constrained applications

BCO-1010
With one Universal Expansion Slot

BCO-1020
With two Universal Expansion Slots

BCO-1030
With 8-bit Digital I/O, DVI-I/DP dual display output, and 6x COM ports

- Supports Intel® Celeron® J1900 (2.0GHz) Quad Core Processor
- Fanless & cable- design for rugged reliability
- Wide operating temperature range (-20°C to 50°C)
- Over-voltage protection (9V to 30V)
- Flexible expansion slots (mini PCIe)
- Single SIM slot for wireless 4G/LTE
- 5 Grms vibration tested and 50G 11ms shock tested
- TPM 2.0
- Dual Nic Mini PC

For more details please scan our QR code.
BCO-1000 series

Industrial Mini Computer

RCO-1000
Ultra compact Fanless System ideal for space-constrained applications

RCO-1010
With one Universal Expansion Slot

RCO-1020
With three Universal Expansion Slots

RCO-1030
With 8-bit Digital I/O, DVI-I/DP dual display output, and 6x COM ports

- Supports Intel® Celeron® J1900 (2.0GHz) Quad Core Processor
- Fanless & cable- design for rugged reliability
- Wide operating temperature range (-25°C to 70°C)
- Over-voltage protection (9V to 30V)
- Flexible expansion slots (mini PCIe)
- Dual SIM slot for wireless 4G/LTE
- 5 Grms vibration tested and 50G 11ms shock tested
- TPM 2.0
- Dual Nic Mini PC

For more details please scan our QR code.
RCO-1000 series

We Design, Manufacture, and Service customers around the world

Low-Power Edge Computer

RCO-3200
Advanced Fanless System based on Intel® Apollo Lake processors

RCO-3211x
With one PCI or PCIe x4 expansion slot

RCO-3222xx
With two PCI or PCIe x4 expansion slot

- Intel Pentium N4200 Quad-core Processor
- Power Ignition Management and CAN bus Network Protocol
- Supports up to 8x PoE with M12 Lockable Connectors
- Wireless WAN for 4G LTE Connectivity
- Isolated Digital I/O and Expandable PCI/PCIe Options
- TPM 2.0 available

For more details please scan our QR code.
BCO-1000 series

High-Performance Industrial Computer

RCO-3600
Advanced Fanless System based on Intel® Skylake & Kabylake-S processors

- Support 6th/7th generation Intel® Core® i7/i5/i3, Pentium®, or Celeron® ProcessorsWide Operating Temperature (-25°C to 70°C)
- 9~50VDC input with Over/Under-Voltage and Over-Current Protection
- Anti-shock/vibration, Rugged and Cableless Design
- Triple Independent Displays (DVI-I and 1x DP and 1x HDMI optional)
- 2x full-size Mini PCIe (shared by 2x mSATA) for communication or expansion modules
- SIM Slots for Cellular Mobile Communication
- TPM 2.0 Support

For more details please scan our QR code.
RCO-1000 series