An Overview of New Technologies for Next Generation Industrial Computing

Introducing the Omnix™ Product Family by ICS Advent

As the demand for business-critical industrialized computing solutions continues to expand into a variety of new applications and market arenas, many of the core technologies that provide the foundation for industrial computing capabilities are undergoing dramatic growth and change. Using a completely new "from-the-ground-up" design approach, the Omnix product family delivers a full range of industrial computing platforms that can be deployed in either rack-mount or stand-alone configurations. In order to accommodate the full spectrum of applications requirements and allow cost-effective deployment, the Omnix chassis options span a variety of sizes, features and power configurations. These options include 1U, 2U, 4U, 5U and 6U rack sizes with additional options for either standard 17-inch or long 23-inch depth configurations.

Table of Content

Overview 2
Critical Design Objectives 2
Modular Backplane Design 2
Robust Shock and Vibration Resistance 2
Tailored Power Options 3
Optimal Cooling and Airflow 3
Remote Status & Fault Monitoring 3
Future Extensibility 3

OMNIX™

ICS ADVENT

www.icsadvent.com
800-523-2320

5009-060100

The Omnix family makes extensive use of modular design concepts in order to provide customers with maximum latitude for configuring targeted systems to meet their specific functionality and cost requirements.

…all Omnix products provide excellent shock and vibration characteristics without incurring unnecessary complexity or cost.

…the Omnix family development has made extensive use of sophisticated thermal modeling and simulation techniques to eliminate internal hot stops and optimize cooling efficiency.

Overview

As the demand for business-critical industrialized computing solutions continues to expand into a variety of new applications and market arenas, many of the core technologies that provide the foundation for industrial computing capabilities are undergoing dramatic growth and change. At ICS Advent our commitment to continued leadership in industrial computing technologies has led to the development of the Omnix product family, which is designed from the ground up to deliver an optimal environment for hosting tomorrow's industrial automation, telecommunications, Internet services, process control, medical instrumentation and other business-critical applications.

Using a completely new "from-the-ground-up" design approach, the Omnix product family delivers a full range of industrial computing platforms that can be deployed in either rack-mount or stand-alone configurations. In order to accommodate the full spectrum of applications requirements and allow cost-effective deployment, the Omnix chassis options span a variety of sizes, features and power configurations. These options include 1U, 2U, 4U, 5U and 6U rack sizes with additional options for either standard 17-inch or long 23-inch depth configurations.

Critical Design Objectives

While the Omnix family is an outgrowth of ICS Advent's fifteen years of experience and leadership in the design and manufacture of industrial computing solutions, it also represents a fundamentally new design. Leveraging significant innovations in the use of modular architectures and high-reliability designs, Omnix systems can be readily tailored to meet the current and evolving requirements of our customers. Based upon hands-on applications experience and extensive feedback from real-world users, the Omnix series has been driven by a core set of critical design objectives that are focused on providing optimal performance, reliability and configurability.

A few of these key design objectives are briefly outlined below and are also covered in more detail as a part of the series of Technology Whitepapers that accompany this overview.

Modular Backplane Design

The Omnix family makes extensive use of modular design concepts in order to provide customers with maximum latitude for configuring targeted systems to meet their specific functionality and cost requirements. One of the key innovations that sets the Omnix family apart from both commercial desktop computers and traditional industrialized computers, is the use of a "modular backplane" architecture, which empowers customers to incrementally tailor the number and mix of PCI and ISA slots that is best for their specific applications. As described in the white paper on Modular Backplane Design this built-in flexibility gives the higher-end members of the Omnix family unprecedented configurability using a relatively small number of core system components.

Robust Shock and Vibration Resistance

As described in the white paper on Designing for Robust Shock and Vibration Resistance, by making use of innovative "unitized card cage" designs, all Omnix products provide excellent shock and vibration characteristics without incurring unnecessary complexity or cost. Instead of attempting to isolate specific portions of the system through complex shock-mount mechanisms, the Omnix architecture minimizes all of the disparate frequency transfer functions within a unified design,

thereby minimizing out-of-phase vibrations and improving the reliability of the system as a whole. In addition to meeting relevant IEEE, ISO, CE and Bellcore standards for shock and vibration, the Omnix unitized chassis designs assure consistent quality, out-of-the-box reliability and robust performance under extended operation in harsh non-office operating environments.

Tailored Power Options

Although modern industrial computing platforms offer corporate customers and OEM systems builders a wide range of configuration options, one area that can often be a sticking point is the ability to supply adequate power to all of the system components. Not only does a customer's system need to have sufficient total power available; it must also provide the requisite voltage levels in the amounts needed for the specific system configurations. As described in the white paper on Tailored Power Supply Options, the Omnix product family addresses these issues through innovative usage of incrementally configurable power supply designs, which enable customers to smoothly tailor the available power to match the systems' specific power requirements.

Optimal Cooling and Airflow

As detailed in the white paper on Designing Industrial Computing Solutions for Optimal Cooling and Airflow, the Omnix family development has made extensive use of sophisticated thermal modeling and simulation techniques to eliminate internal hot stops and optimize cooling efficiency. These detailed simulations have led to system designs that consistently exceed established cooling specifications and which can reliably handle the full range of load demands. Leveraging the detailed thermal databases already developed for each Omnix chassis, ICS Advent can also quickly simulate the thermal characteristics of any unique customer-defined components, thereby streamlining the delivery cycle for specialty configurations.

Remote Status & Fault Monitoring

The Omnix family of industrial computing solutions also addresses the growing market requirements for using remote monitoring capabilities to meet continuous-uptime requirements, to leverage finite support staff resources and to streamline maintenance of deployed systems. As described in the accompanying white paper on Integrating Options for Remote Status and Fault Monitoring, all of the Omnix system designs build in extensive sensing mechanisms for automatically monitoring critical functions, such as power and cooling systems. To support the full range of customer requirements, status conditions and fault alerts can be displayed locally on the systems' LCD front panel and/or automatically transmitted to a centralized monitoring location using an optional plug-in monitoring card.

Future Extensibility

Not only do the design innovations in the Omnix family deliver an unparalleled range of standard configurations and capabilities; they also provide optimal extensibility for incorporating new technologies, specialty requirements and custom-tailored OEM systems. The blending of commercially available, standards-based technologies with highly flexible modular backplane and power distribution architectures gives the Omnix series an inherent capacity for smoothly meshing with newly emerging standards as well as cost-effectively accommodating unique customer requirements.

Applied Computing

Applied Computing describes classes of dedicated or fixed-function devices that are becoming connected, often via Internet Protocol (IP)-based networks or the Internet itself. Some examples of these applications include voice/data communications, transaction processing and wireless remote access. The industry relevant factor is the trend toward more processing power and greater connectivity. Applied computing applications collect, communicate and control the data within the corporate computing environment, which is then stored and manipulated into information by enterprise PCs and servers.