STD Bus:

Performance without Complexity

A diverse spectrum of embedded and dedicated applications embraces the STD Bus.

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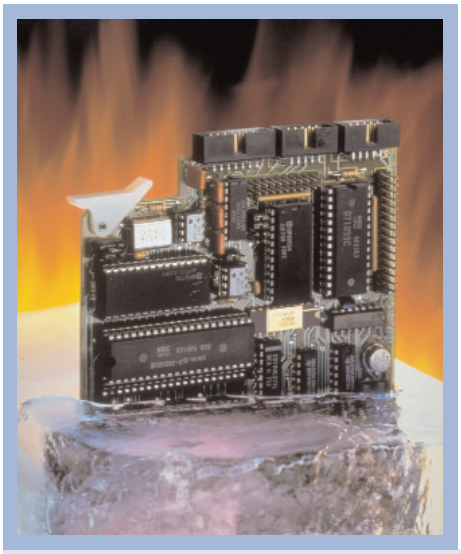
The STD Bus is referred to as the "Blue Collar Bus" due to its use in industrial and process control applications. Its continuing popularity is driven by the ability to support a large mix of I/O cards and to easily change its configuration in the future. Since the STD Bus supports the x86 architecture, it is possible to leverage the vast software infrastructure supporting PCs into products that can survive in harsh industrial environments. STD Bus is an evolutionary, not a revolutionary bus. As such, it has migrated to more and more powerful processors while still supporting existing I/O cards designed by vendors and customers alike. It has earned the reputation for being small, modular, rugged, reliable, and easy-to-use. The result of this union is faster time-to-market with less risk at a reasonable cost.

An Industrial Bus

The STD Bus is unique in the fact that it is an industrial I/O bus. As the approved IEEE-961 microcomputer bus, the STD Bus is popular because of its small size, rugged design, high quality, and support from multiple vendors worldwide. STD means Simple to Design, Simple to Develop and Simple to Debug. STD Bus has a number of advantages over other bus architectures. Its simple interface, small card size (4.5" x 6.5"), solid nearly square peripheral cards, and strong card mounts, tolerate shock and vibrations to make the STD Bus ideal for rugged industrial environments.



CMOS STD Bus boards will work from -40°C to +85°C for use in harsh industrial environments.

The STD Bus is designed for the factory. The boards are installed in card cages that can be mounted in sealed NEMA type enclosures or RETMA racks. The small size of STD Bus boards are ideal for industrial environments since the cards don't bend or flex and are engineered to withstand shock and vibration. A STD Bus card is firmly held in place in a card cage on 3 sides and with an optional hold down bar across the card ejector. This secure placement holds the cards without coming loose.

Since the STD Bus is I/O intensive, many configurations have multiple cards in a rack. Key to the design of STD Boards is the ability to be quickly and easily removed and reinstalled in the card cage. Mean Time to Repair (MTTR) is very low for STD Bus cards since replacement is as simple as sliding a card out and the new card back in the rack that is important for systems that require field maintenance.

The STD Bus is known for its wealth of real-world interfaces. I/O interfaces are available for pressure and temperature measurement, stepper and large motor control, relays, analog and digital interface, networking, video, and so on. Also, users who need special I/O functions for their specific application

can easily design and construct their own.

STD Bus card cages securely hold the boards while providing quick and easy installation.

One of the key features of the STD Bus is its CMOS STD Bus version. CMOS inherently draws lower power and will operate over extended temperature ranges.

CMOS STD Bus boards will operate over the industrial temperature range of -40º to +85ºC without teed of fans or other cooling. STD Bus vendors' CPUs will operate without the need of rotational storage media, keyboards, and monitors in harsh environments. Other open systems architectures can't match this.

Enter the PC Architecture

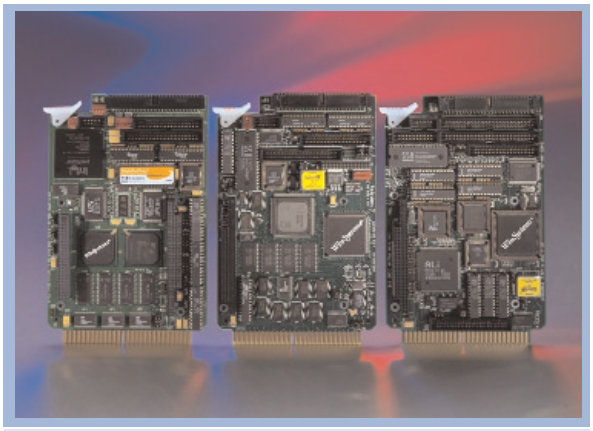
The PC has forever changed the face of the computing landscape and impacted single board computers as well. With over 500 hundred million PCs installed worldwide, the PC-architecture has become a de facto standard. The PC architecture is neither the most efficient nor the most sophisticated, yet it has become a popular embedded standard. The reason is that it is the software, not the computer hardware that drives the selection process for a system. It has spawned a generation of trained, computer-literate engineers and technicians across many different disciplines that can apply the technology to their selected areas. The result is that the initial design process evolves around the question, "Why don't we embed a PC into this application?"

Best of Both Worlds

The STD Bus was originally designed to be processor independent, but has evolved to become a rugged x86 platform for use as an industrial embedded PC. This means that a designer can now use the software tools, operating systems, and utilities that are inexpensive, available, and robust with a hardware platform specifically designed for industrial applications. STD Bus supports CPUs that range from an entry level 8088 to Pentium-class processors. Regardless of the type of CPU selected, all the existing I/O cards are still supported to provide an orderly and planned migration path for more demanding applications. The result is a stable system not threatened by obsolescence or abandonment every 5 years because of advancing processor technology.

One interesting observation is that the raw CPU speed is not the driving factor for its selection in a system. A processor operating at speeds over a gigahertz may be appealing for desktop use, but is of little value for the typical industrial or factory environment due to its high power, heat dissipation, narrow operational temperature range, and required use of a fan. Design engineers have realized that even the entry-level 386sx CPU is still a good, low-cost, reliable solution for many industrial applications -- just make the development environment cost-effective and available over a long period of time.

An example of this is WinSystems' 3 latest STD Bus CPU boards which are based upon a 386SX-33, 586-133 and Pentium MMX-166/266 processor. All are single board computers with a standard I/O complement offered at different performance and price levels. All these boards can use the same software and will support the same I/O boards in a card cage without modification that allows a designer to easily migrate to a more powerful processor. Plus all of the boards can operate from -40° to +85°C.



STD Bus CPUs offer a migration path from 386 to Pentium-class processors while keeping software and I/O compatibility.

Here Today, Here Tomorrow

STD Bus' popularity is due to its open architecture, rugged industrial design, small size, modularity, low cost, and ease of design of I/O interfaces. It is well documented with over a half million systems presently installed. Integrating the x86 and PC architecture has allowed the STD Bus to continue to be a popular

solution by reducing cost and easing the burden of software development, debugging, maintenance and documentation.

A STD Bus system will operate where a commercial PC unit won't either fit or survive. Applications continue to multiply because of the vast array of inexpensive and available software tools as well as an army of programmers that know how to use them. In combination with the software, the optimum hardware solution can be selected based upon the criteria of performance, packaging, form factor, cost, survivability in harsh environments, and industrial board selection and availability.

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The STD Bus is an open system architecture with no patents, royalties or licenses. Open system level design allows for lower development cost, provides quicker time-to-market, and the opportunity to move software across different levels of CPU power.

A diverse spectrum of embedded and dedicated applications embraces the STD Bus. Some typical applications include:

- Machine Control
- Robotics
- Medical Instruments
- Military
- Process Control
- Printing
- Telecommunications
- Data Acquisition
- Weighing/inventory
- Inspection/Quality
- Factory Automation
- Energy Management
- Communications controllers
- Test/Measurement Equipment
- Semiconductor Manufacturing
- Specialized Test fixtures