EXTENSION OF THE SCHROFF CPCI SERIAL PRODUCT FAMILY FROM NVENT

A new revision of the CompactPCI Serial specification was ratified in 2013. The update includes adaptations and features to be implemented in a new revision of the hardware.

As pioneer in the CompactPCI Serial environment nVent has extended their product family. With the revised SCHROFF CPCI Serial platform nVent is able to cover all features and functionalities within this new standard.

When CompactPCI was ratified the first time in 1995, the fundamental PCI bus was the standard bus structure for the Personal Computer. Therefore this bus was the base for all chip manufacturers. Compatibility to the existing PC world helped CompactPCI become an established standard, offering a scalable, flexible and cost efficient platform for all kinds of industrial applications like railway, audio broadcast, energy, medical, test & measurement or oil & gas. Due to the evolution of PC technology, the CompactPCI specification needed to be updated as well. The processing of higher data rates required serial interfaces like Ethernet, SATA or USB. Further to that a lot of hardware periphery like a HDD is now available with serial rather than with a parallel interface. Driven by that evolution PICMG introduced the CompactPCI Serial standard, which was published in March 2011. CompactPCI Serial (CPCI.S-0) as the successor of CompactPCI offers a lot of new features while remaining backwards compatible to CPCI.

COMPACTPCI PLUSIO TO SUPPORT THE MIGRATION OF CPCI SERIAL INTO EXISTING PLATFORMS

CompactPCI PlusIO (PICMG 2.30) is backwards compatible to CompactPCI (PICMG 2.0). It offers the modularity, robustness and economic efficiency of CompactPCI, adding fast serial data transfer inside the same 19" standard environment. The pin number of the J2 connector for 32-bit system slots is sufficient for leading 4 PCI Express x1 links, 4 SATA, 4 USB 2.0 as well as 2 Ethernet 1000BaseT interfaces to the backplane.

CompactPCI Serial offers all established serial protocols on the consumer market, like USB for peripheral hardware including extended memory, in- and output devices or communication modules. An internal HDD can be directly connected to the processor via S-ATA. For data exchange PCIe Gen 3.0 and Ethernet 10GB BaseT provide a significant increased throughput capacity. This high data transfer rate makes the platform predestined for high performance communication like broadcast, image processing or data acquisition. With these new serial protocols another helpful feature is supported. Hot Plugging enables the user to exchange certain boards even during operation. This function increases system serviceability substantially. Hard Disk Drives, Wireless Communication Boards or even CPU boards can be removed without damaging any device and disturbing the operation of the system.

NEW REVISION REMOVES LAST LIMITATIONS OF COMPACTPCI SERIAL STANDARD

To implement further features into the CPCI.S-0 standard, PICMG opened the specification for revision in 2013. One significant adjustment was the backplane setup. In the original ratified specification the system slot was on the left side only. The experience taught that some applications require the system slot on the right side. A further change was applied to the pinout of the P6 connector. Users often need to have their interfaces on the backside of the system.

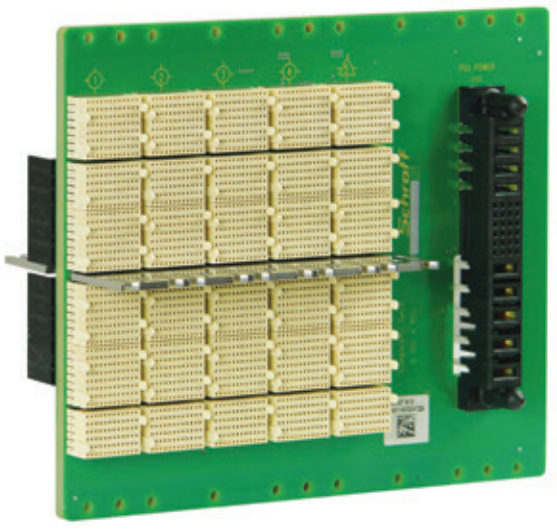
I/O Signals like DVI, USB or Ethernet must be routed directly through the connector to the rear transition module. But in the original specification, the P6 connector was occupied by Ethernet signals to be routed through the backplane. With the new revision both pinouts are possible. With the serial protocols which provide the high data transfer rate, Hot Plugging functionality and backwards compatibility, CompactPCI Serial is a platform for quite a wide range of possible applications. This technology is even capable to be implemented into ruggedized and conduction cooled applications, making this standard applicable for all purposes.

nVent is a part of the more than 30 manufacturers within the PICMG working group and plays a significant role in defining and implementing new specifications. Thus nVent was one of the first companies offering CompactPCI Serial Backplanes, Power Supplies and Chassis.

Extension of the SCHROFF CPCI Serial Product Family from nVent

NEW SCHROFF SYSTEM IN LINE WITH NEW SPECIFICATION

The ratification of the revised PICMG CPCI.S-0 specification led nVent to extend their product portfolio by introducing the new 4U CPCI Serial System with a width of 84HP and a huge range of possible configurations. The modular design of this family guarantees a scalability which allows individual settings without complexity. The system can be adapted to suit the needs of its user. The configuration most often starts with the definition of the backplane. nVent offers all imaginable types of CPCI Serial backplanes with one to nine slots, different Ethernet topologies (Full mesh or Single Star) the system slot left or right and finally with or without Rear I/O. As previously described, SCHROFF also offer the two different pinouts for the P6 connector. This connector can either be used to route the Ethernet signals on the backplane or without any backplane connection, for the direct routing to the Rear I/O connector.



The SCHROFF backplane family offers a enormous number of different combinations. The connector for the pluggable power supply can be either integrated on the backplane, or linked with a power adapter board which connects the 12 V and GND between SCHROFF CompactPCI Serial power backplanes and backplanes. With the available space of the 19" chassis the user could add additional power supplies for power redundancy or even realize several independent CPCI Serial systems in one chassis.

REDUNDANCY TO ENSURE UNINTERRUPTIBLE POWER SUPPLY

Another very important part of the infrastructure is a proper power supply. Each application has certain power requirements. The nVent pluggable power supplies are flexible for many operational conditions and suitable for extended temperature conditions from –40°C to +70°C at full rating. Active current share supports a N+1 redundancy and enables power consumption sharing between up to four power supplies, which allows a hot-swap replacement during operation.
The AC PSU has a wide input range of 90-264 VAC, and provide 12V output and 5V standby as defined for CompactPCI® Serial specification.

Instead of a pluggable unit the user may prefer an open frame PSU which usually provides a higher output power. With the various configurations nVent is able to cover 98% of all requirements for CPCI Serial applications. The power input is as for CompactPCI at the backside of the unit. This supports a power entry at the rear side of the system which avoids any disruptive cabling at the front.

SCALABLE COOLING ADAPTED TO THE APPLICATION NEEDS

The replaceable fan tray in the bottom of the chassis guarantees sufficient cooling of the application. Depending of the number of used slots the fan tray can be extended on demand. The user can chose between two or three powerful fans to ensure proper heat dissipation. The optional fan control module monitors and regulates the temperature by controlling the fan speed. In case of a malfunction or an over temperature event an alarm by LED's in the front panel warns the user. These LED's also indicate the power status and give the user an overview about the status of the complete system infrastructure.

To increase the serviceability the chassis can be equipped with telescopic slides. This would be advantageous for replacing any Rear I/O board. With the telescopic slides the system can be serviced while in the rack. Nothing needs to be disassembled and any maintenance at the application can be done without interrupting the operation of the system.

Extension of the SCHROFF CPCI Serial Product Family from nVent

COMPLETE SYSTEM SOLUTIONS REDUCES DEVELOPMENT TIME AND COST

With this new generation nVent is able to cover all requirements an application based on CompactPCI Serial could have. All devices like power supply, cooling or backplane are designed according the IEEE and PICMG standard and optimally matched to one another. Supported by the scalable platform the system can be configured to meet exactly the customers requirements. In addition to reduced development costs, the user also profits from short development and manufacturing times.

FURTHER ENHANCEMENTS OF CPCI SERIAL SPECIFICATION

Beyond the mentioned modifications the CompactPCI Serial specification is developed continuously. Currently the PICMG working group is defining a standard for a shelf management light for CPCI Serial. This shelf management is monitoring features including power management and cooling control, event sensor logging, electronic keying, and hot-swap monitoring. These functions will be described in a subsidiary specification of CPCI.S-0.

ABOUT ENCLOSURES

Electrical systems come in all shapes and sizes, from massive industrial controls to single components. nVent offers a comprehensive range of enclosures that house these vital assets. Marketed under the nVent HOFFMAN and SCHROFF brands, our enclosures offer two-pronged protection: safeguarding electrical equipment from the operating environment and people from electrical hazards.

The SCHROFF brand contains a broad portfolio of products from printed circuit board (PCB) accessories, such as card retainers, conduction cooled frames, front panels and handles to subracks, cases, backplanes, power supplies, cabinets and pre-assembled chassis for embedded computing systems.

ABOUT NVENT

At nVent, we believe that safer systems ensure a more secure world. We connect and protect our customers with inventive electrical solutions. nVent is a $2.1 billion global company that provides enclosures, electric heat tracing solutions, complete heat management systems, and electrical and fastening solutions. nVent employs 9,000 people worldwide.

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