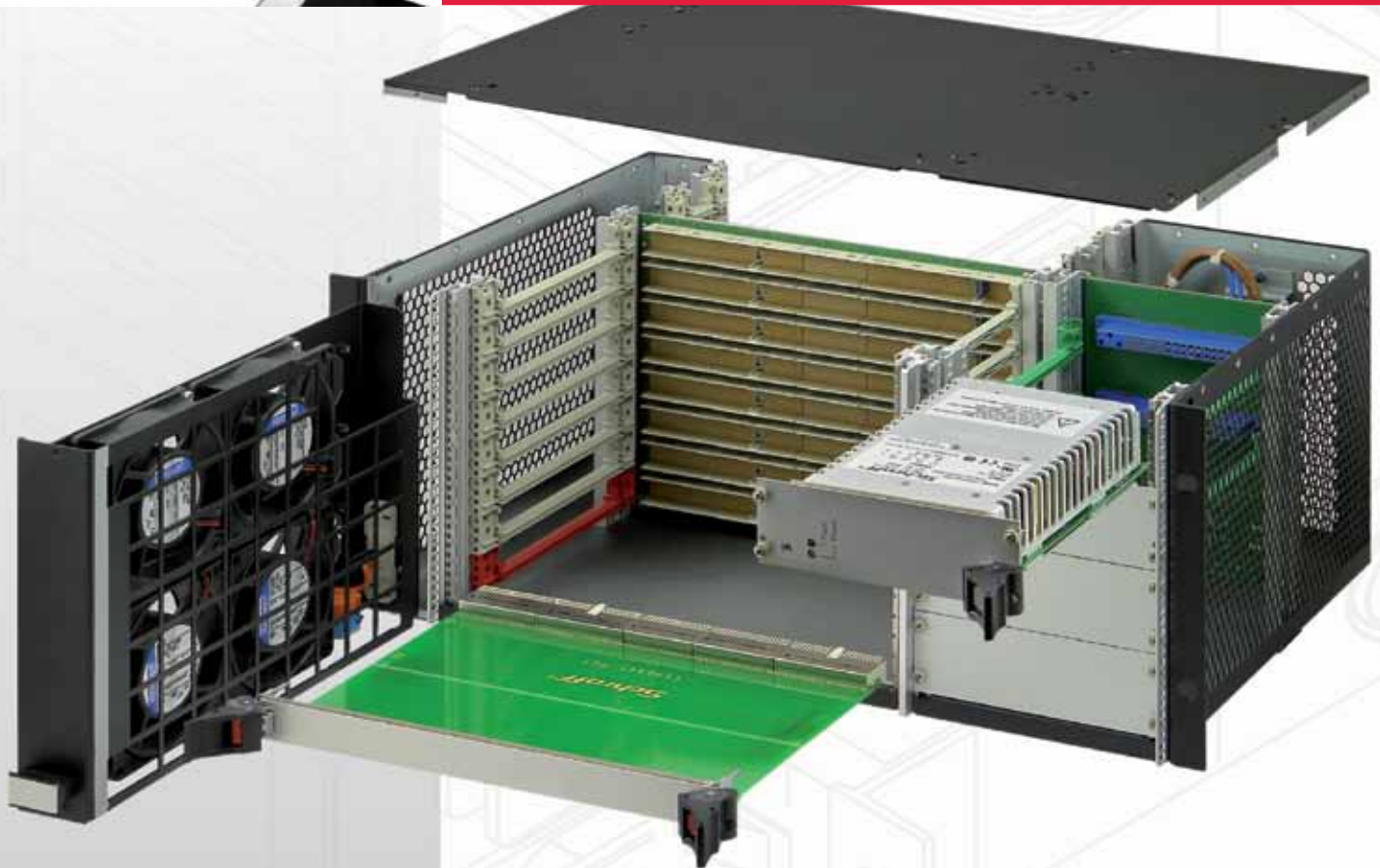


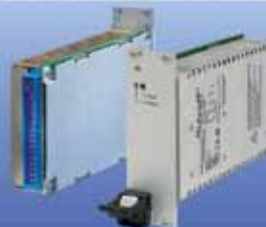
Electronic System Solutions



From the backplane to the system packaging platform—
highest technology from a single source

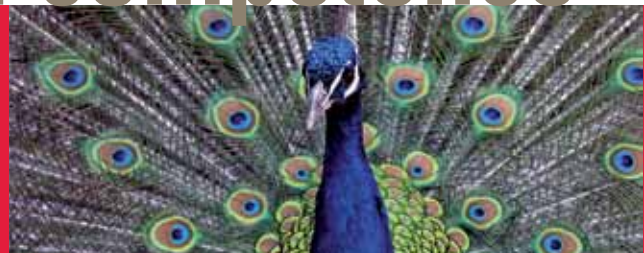


Everything
an enclosure system needs



Mechanics and electronics from a single source...

The future is system competence



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Managing Your Project	page 8
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Pentair Technical Products' Schroff brand is a leader in electronics packaging components and systems worldwide.

In times of global competition, we all face the same challenges of optimizing processes and reducing costs. Our systems and complete solutions are based on globally standardized product platforms that support fast, sustainable and cost-effective development. From conception, project management, prototype construction, testing, certification and pre-production through manufacture to comprehensive after-sales service, we take responsibility for your key processes. What is more, Pentair Technical Products remains your dependable partner throughout the entire lifecycle of your products. Worldwide.

Pentair Technical Products, a Pentair global business unit, is the leading provider of worldwide product and service solutions for enclosing, protecting and cooling electrical and electronic systems.

...the best thing that could happen to your system!

Schroff Electronics Packaging: More dependability. More systems.

Mechanics and electronics from a single source.

As experts in electronics packaging we provide everything your system needs from system solutions that meet the latest standards to modified standard components or engineered solutions. In developing and manufacturing backplanes, power supply units and system management solutions, we are as innovative, competent and reliable as we are with our 19" mechanics. We can even help you tailor cooling solutions and EMC-compliant designs. The result? Your products are quicker to market since you are able to concentrate entirely on your core competency.

See pages 4 and 5.

Always at the cutting edge.

As a pioneer and trendsetter in electronics packaging solutions, the Schroff brand has been synonymous for over 40 years with competence in mechanics, electronics, climate control and system management. Accordingly, for decades we have been an active member of global standards committees such as IEC, IEEE, VITA and PICMG and taken a responsible role in setting new standards. This is because Pentair Technical Products, as an international enterprise with globally active customers, feels jointly responsible for the rapid and efficient realization of technological advances and product innovations that benefit our customers.

See pages 6 and 7.

One company, all the capabilities.

Since developments are most effective when expertise in applications, development and manufacturing function smoothly together, Pentair Technical Products brings all our resources together in a vertically integrated organization. Resulting short development times ensure that the backplane, power supply, cooling and mechanics form an optimized unit. In short, with the Schroff brand your system is in the right hands from the start.

See pages 8 and 9.

LEAN – The efficient way to a system solution.

Production at Pentair Technical Products means manufacturing on state of the art equipment using the most up-to-date and lean production methods. Why do we place value on this? Because it allows us to develop cost-effective, quality solutions for our customers — flexibly, quickly and dependably.

See pages 10 and 11.



Our standard product offering and engineering design expertise...

All components from a single source

Mechanical and electronic components and systems



WHAT CONSTITUTES A SYSTEM?

A combination of mechanical components, such as a subrack, or case with electronic components, which may include a backplane or power supply unit, a cooling unit where appropriate and a system management module.

WHAT WE OFFER:

■ Backplanes

AdvancedTCA, MicroTCA, CompactPCI, CompactPCI Express, CompactPCI Plus, PXI, VMEbus, VME64x, VXS, VPX, H.110, PSB, universal and power backplanes and test adapters.

■ Mechanics

Subracks, desktop and tower cases, chassis and cases with 19" compatible dimensions, AdvancedMC carriers, AdvancedMC modules, plug-in modules and front panels.

■ Cooling

19" fan trays, 19" blower fans, air filter fans, AC and DC fans, heaters, air conditioners and air/air or air/water heat exchangers.

■ Power supply units

Plug-in equipment to the 19" standard, open frame and power systems, AC/DC and DC/DC converters, switch-mode and linear regulators.

■ System management

Shelf managers, fan monitoring and power management.

Suitable for any requirement.

Our products are based on standardized components that can be matched quickly and simply to individual requirements. Based on modular building blocks, they ensure that even the highest demands, functionality and security are maintained under all conditions. Whether you require a standard product, an individually designed single component or an engineered solution, our products perform with total reliability and quality.



...enable us to provide the optimum solution for every need.

Application specific solutions



A robust standard product range.

Our comprehensive and highly developed standard product range offers you mechanical, electronic and thermal components with an all but unlimited choice of dimensions and performance specifications. Simply select a complete off-the-shelf system or configure your system to your exact requirements with our standard components, found online or in our catalog.

Flexibility for modifications.

Frequently, only small adjustments are necessary to transform a standard product into the perfect solution. We make modifications to your individual specifications quickly and reliably.

Competence for new developments.

If your requirements cannot be met with standard or modified product solutions, our qualified and experienced team will create an engineered solution for your system. Rely on our development and manufacturing competencies for exact and efficient results.

www.schroff.us

Active participation in international standards committees...

Create the future and secure your

Research and development ...



Our finger on the pulse.

Rapid introduction to the market without costly development and testing processes – our teams of experts worldwide have worked on international standards committees for decades with this goal in mind. Developing innovations and new technologies drive the need for standards, and we have our finger on the pulse. Coupled with over 40 years of competence in electronics packaging, our customers benefit from a product range that conforms to the standards along with high-value technical solutions that are on the market earlier than many others.

WE BRING OUR KNOW-HOW TO THE FOLLOWING STANDARDS COMMITTEES:



International Electrotechnical Commission (IEC)

Our know-how as experts in electronics packaging has contributed to the forming and updating of the European standard “Mechanical structures for electronic equipment” for 30 years. Many of these standards have been based on Pentair Technical Products proposals, and we have played a decisive part in their implementation.



Institute for Electrical and Electronics Engineers (IEEE)

Committees of this American institute are concerned with the standardization of techniques, hardware and software. Among other areas of involvement, Pentair Technical Products engineers presided over the development of the IEEE 1101.1 standard.



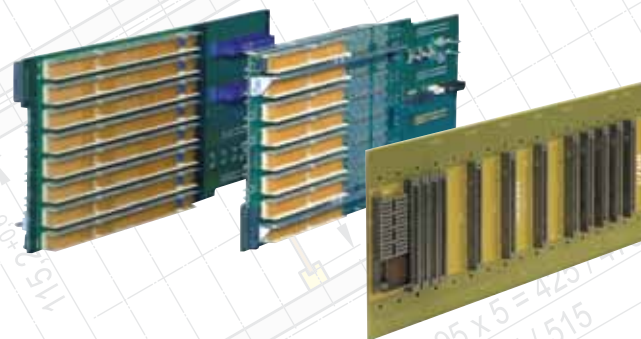
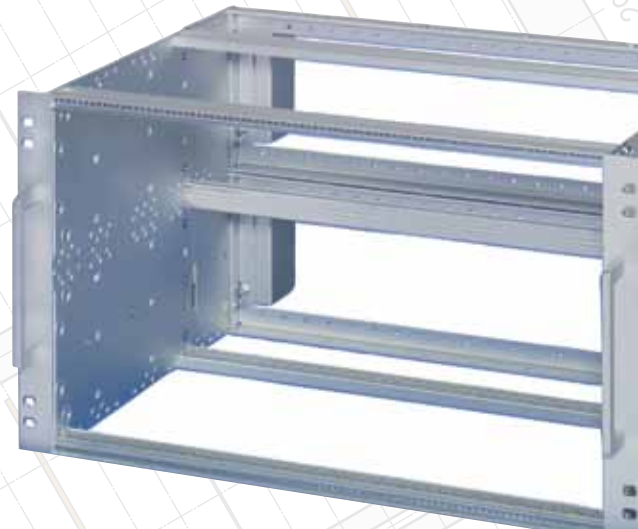
VMEbus International Trade Association (VITA)

For over 20 years we have also been an active member of VITA, whose focus is the specification of modular embedded real-time systems. Pentair Technical Products has given formative impulses to such standards as VITA 47.



PCI Industrial Computer Manufacturers Group (PICMG)

We are at the forefront in the specification of telecommunications and industrial applications. Accordingly, we are at a high level in the newly developed AdvancedTCA and AdvancedMC standards and have special responsibility for the mechanics component of the MicroTCA standards.



...reduces our time to market and creates global market access

advantage

... for your success in the market

Comprehensive product range — and products to meet our customers' needs.

Schroff brand customers can take advantage of one of the widest standard product ranges, which covers most of the IEC, IEEE, PICMG and VITA standard specifications. Many products also conform to UL, MIL, NEBS, Bellcore and Telcordia standards. And we implement other standards into market-leading solutions as well. Our extensive experience makes us your best partner for implementing even the most specific requirements.

All our products conform to the EMC and low-voltage guidelines of the European Union and RoHS.

Declaration of Conformity.

On request, we will issue a Declaration of Conformity for our products. This document confirms that a given product conforms to one or more standards and describes the way in which it does. This document supports technology exports and facilitates obtaining approval for international markets.

YOUR ADVANTAGES:

■ Quicker to market and at less cost.

Regardless of the technology you select, our standard product range and complete systems provide decisive advantages. Reduced development costs and short development and manufacturing times enable you to concentrate entirely on your core competency. Outlay for verification and testing is also reduced to a minimum, as we have already conducted tests on many of our off-the-shelf products. The result: you get to market considerably faster with less cost.

Test reports are available at www.schroff.co.uk/academy

■ Dependable system function.

In addition to rapid development times and low prices, you can rely on the harmonious functioning of your system. With leading expertise in both mechanics and electronics, Schroff systems ensure the backplane, chassis, cooling, power supply and system management, including all interfaces, are optimally matched.

■ Safety and protection.

Many of our standard products can accept additional security provisions such as EMC protection, shock and vibration resistance, and even earthquake resistance. You can be sure that even in extreme applications, your product will perform.



Reliability for your project planning.

Project Management – key to your

Tailored solutions...



BEFORE THE START OF THE PROJECT

Consultation from the outset.

Since our customers' requirements are our central priority, we provide a team of specialists right from the consultation phase. Our engineers develop an engineered solution based upon your requirements, ensuring the success of your project from prototype to production, including full DRM (Design for Manufacturing) and DVT (Design Validation Testing).



COMMENCEMENT OF THE PROJECT

Development and layout: doubly competent.

The parallel development of the mechanical and electronic components ensures their perfect harmonization along with short development times — the decisive factor for the trouble-free functioning of the overall system. It's exactly for this reason that all our resources are combined under one roof. Our experienced developers and modern design tools are the guarantee of our high-quality standard and our engineers are constantly researching many areas including signal integrity, EMC, cooling, shock and vibration resistance, and surface treatment.



Modeling, simulation and measurement: 100% quality.

Our top priority at every development stage is the continuous assurance of 100% quality. Our engineers therefore always use the most up-to-date modeling and simulation tools, measuring instruments and in-house-designed, high-performance test adapters. This enables us to optimize the development process and ensure, from as early as the layout stage, that we are providing the best and highest-performing products. For more advanced tests we work in co-operation with certified testing and examining institutes.



Strategic purchasing: intelligent procurement.

Our quality assurance begins with our choice of suppliers. We do business only with certified and globally active suppliers. From the development phase, our strategic purchasing department procures time-critical components to deliver market advantages to our customers with minimum development time.

Short development and manufacturing times.

SUCCESS

...fast and reliably implemented

PROTOTYPE MANUFACTURE

Prototype manufacture: quick and tested.

As soon as you have approved the development we begin manufacturing your prototypes — which are produced using the same equipment that will manufacture your actual product, preventing deviations. As only a properly functioning system can validate testing and identify potential faults in your own application, prototypes enable you to make pre-production adjustments.



PRODUCTION AND DELIVERY

Production: fast and efficient.

Once the prototypes have been tested successfully, production begins. Our vast manufacturing depth and multiple processing options for both mechanical and electronic components allow us to closely control and monitor the production process. You can rely on our qualified technicians and modern technologies to ensure consistently high quality.

Our manufacturing philosophy provides yet more benefits. Our modern machinery is reliable and allows fast, cost-effective production in both small and large batch sizes. We can carry out special processes in-house, such as the conformal coating on backplanes and power supply units required for certain applications. Thus you lose no time and benefit from the highest quality and reliability.

100% final check and function testing: dependable quality.

As in all previous project phases, our quality management covers every stage of the process, and no product leaves our premises without 100% inspection.

Shipping and logistics: safely to the destination.

Packaging is also important. Because electronic components are especially sensitive, our specialists develop the perfect packaging and logistics solution for your product, ensuring it arrives in good condition via the carrier of your choice. We also take the environment into consideration by using reusable packaging.

After-sales services: an ongoing partnership.

After the product is installed on your premises, our project managers will continue to advise you on any questions.



High-performance product design.

Our competencies – an overview

Layout, simulation and production...



PRODUCT CONFIGURATION

You can easily create the product you require in the following ways:

- Configuration tables in the catalog or online
- Interactive questionnaire forms online

You can find further information at www.schroff.us

LAYOUT

For the optimal design with maximum performance:

- Latest CAD software, simulation tools and measuring equipment
- Experienced developers
- Up-to-date layout tools, e.g. Mentor Graphics Board Station and PADS
- 3D files of the layout tools are used in the mechanical design

SIMULATION AND TESTING

For a rapid development process and high reliability:

- For interference emission and interference immunity: EMC/CE test location
- Circuit simulator: P-Spice
- For signal integrity measurements: backplane board simulation using Ansoft Designer
- For thermal simulations: Flowtherm
- For thermal tests: wind tunnel and climate cabinet
- Shock and vibration test
- IP protection test

MANUFACTURE OF MECHANICAL COMPONENTS

The best processes, assuring flexibility and high quality:

- Guillotining
- Power-press punching
- CNC punching
- Routing
- Bending
- Laser processing
- Joining techniques
- Steel and aluminum welding
- Galvanic surfaces for steel and aluminum parts
- Screen or digital printing

Machines developed in-house for still higher production efficiency:

- Fully-automated production lines for horizontal rails
- Production facility for threaded inserts
- Highly flexible punching facility for custom front panel manufacture



Flexible and versatile manufacturing.

...the highest quality and viability

MANUFACTURE OF ELECTRONIC COMPONENTS

Economic solutions with the highest precision:

Solder paste printing

- High processing speed
- Fewer errors than traditional screen printing
- No templates
- Economic even for small batches

Automatic SMD placement

- High-speed placement for large batches
- Flexible placement for small batches

Vapor-phase soldering

- Low temperature and homogeneous temperature distribution prevents component overheating
- Suitable for all types of SMD components and carrier substrates

Wave soldering

- For wired and SMD components
- High speed

Press-in operations

- Automated process with force-displacement monitoring
- Fully automatic feed of connectors

Conformal coating

- Protection from corrosion and fungal infestation
- Protective lacquer to MIL and UL specifications



QUALITY CONTROL

Striving for 100% reliability:

FMEA

- Looks for potential weaknesses in product or production processes during the design and development phase

Automatic optical inspection

Electronic sub-assemblies testing for manufacturing defects such as:

- Poor solder joints
- Wrongly-placed or missing components

In-circuit test

- Detects faults in the conductive path such as short circuits or discontinuities
- Isolates soldering errors and component faults
- Circuit block tests

Function and safety testing

- System functions
- Earthing test
- Insulation test (high-voltage test)

Fatigue/burn-in test

- Fatigue testing of power supply units under operating conditions
- Early-failure detection



The right solution for every application.

Our know-how, our markets, our

Markets: Datacom/Networking, Telecom, Test and Measurement, Defense/Security, Medical Embedded Control, General Electronics, Industrial and Energy



TEST AND MEASUREMENT:

Application:

- Flexibility to accept different module widths and heights
- Good accessibility of measurement points on the AMC modules when built into the system
- External data interface
- Meets the base specification of the PICMG MicroTCA.0 R1.0 standard

The solution:

- RatiopacPRO desktop system with tip-up feet
- Removable top cover including upper board cover allows insertion of double modules and facilitates access to measurement points
- 12 HP slot width for lateral access to AMC modules
- Connections for external measurement equipment allow access to test data
- Data cables are run to connectors on the rear of the backplane to allow external access to data

DEFENSE/SECURITY: RUGGEDIZED, CONDUCTION COOLED, COMPUTER FOR COMMUNICATIONS

Applications:

- Air transportation, shipping, ground transportation
- Electronic equipment that will be exposed to extreme environmental conditions in regards to shock and vibration, the elements and temperature

The solution:

- MicroTCA cold walls and backplane for one MCH slot (single, full-size) and 6x single, mid-size AdvancedMC slots
- The backplane allows for onboard power management (and 3.3V source) for all AMC slots, MCH and fan
- Forced air-cooled with front side intake and rear exhaust via high-speed fan
- Filtered Circular Power Input Module
- Integrated 375W power supply with 12VDC output
- Aluminum construction optimized for weight and thermal dissipation
- Elapsed Time Indicator (optional shown)
- Master Power Switch



Complete and dependable from a single source.

products, our capabilities

COMMUNICATIONS: ENTERPRISE MICROTCA SYSTEM

Requirements:

- Ability to combine MicroTCA technology and proprietary technology in one product
- Small Form Factor System
- High performance/high availability modules
- Fast time-to-market

The solution:

- Customized MicroTCA chassis
- Leverages Schroff mechanics and MicroTCA backplane know-how
- Integrates customer's proprietary technology into chassis



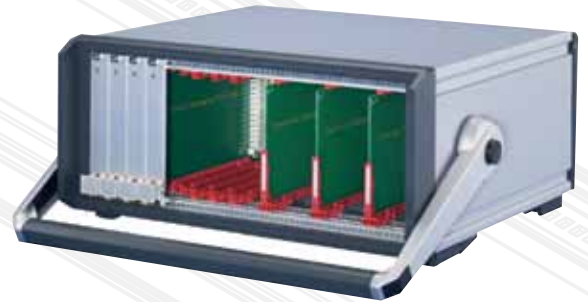
MEDICAL: PORTABLE TEST INSTRUMENTATION

Requirements:

- Aesthetic case
- Rugged/portable solution
- Leverage Eurocard form factor for power and boards
- Easily cleaned/maintained

The solution:

- Case with customized look
- Support for mounting internal accessories
- Rugged handle for portability
- Easy to clean surfaces



COMMUNICATIONS: PS150 SMART POWER SUPPLY UNIT FOR MULTIPLEXERS

Applications:

- Compatibility with the connected multiplexers
- Power failure backup function
- Status reporting
- External alarm input
- Variable mounting depth to suit cabinet dimensions

The solution:

- Power outlets and data transfer to multiplexers
- Integrated battery allowing a backup time of 2 hours with a 100 W load
- Alarm outputs for power failure, module failure and battery fault
- Cabinet door alarm
- Integrated slide rails for different mounting depths



The evolution of high-speed data transmission.

Data Transmission



Parallel Data Transmission

Industrial (IPC): up to 133 MByte/s

An IPC provides a cost-effective solution for deploying mass market PC processors and chips within industrial applications. However, this is not an effective form factor for applications requiring advanced cooling, IP protection, multiprocessors or redundancy capabilities.



CompactPCI: up to 533 MByte/s

Forced cooling and high IP protection make CompactPCI systems suitable for use even in demanding environments. Manufacturers of CompactPCI components guarantee long availability of the components used. Modules can be swapped while the system is in operation (hot swap). Redundancy can be realized only to a certain degree. CompactPCI systems are not multiprocessor capable.



Serial Data Transmission

CompactPCI Plus: up to 32 Gbit/s

CompactPCI Plus is a new standard for multiprocessor-capable, serial data transmission with performance up to 32 Gb/s. Various software protocols allow broad compatibility (e.g. PCIe or USB for graphics boards and I/os, S-ATA for hard disks and GbE for multiprocessor systems). The same form factor as CompactPCI together with the PICMG 2.30 specification (CompactPCI) I/O boards can also be used in the new systems.

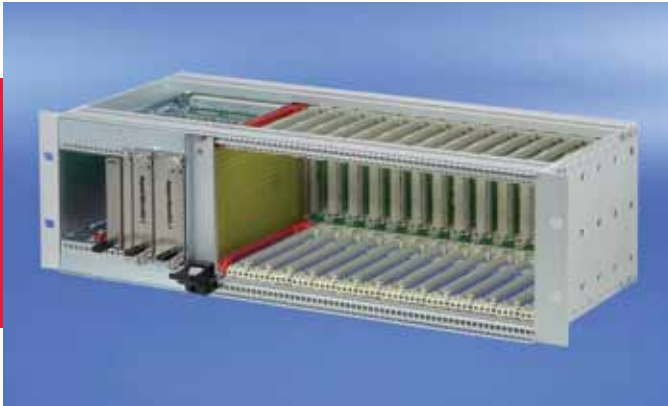


MicroTCA: up to 40 Gbit/s

High flexibility, maximum performance and full redundancy, all in a very small form, is what sets MicroTCA systems apart. Its hardware management system allows targeted control of individual boards and thus offers, for example, full hot swap and remote management—the targeted log-off and shutdown of the board to be replaced. Multiprocessor ready, with serial data transmission up to 40 Gb/s and a wide range of supported software protocols, MicroTCA represents the pinnacle of industrial data processing systems.



Application examples:



Hybrid system (CompactPCI/MicroTCA): Modification of a MicroTCA single module board cage into a 3 U 19" chassis.



Hybrid system (CompactPCI/CompactPCI Plus): CompactPCI Plus chassis with backplane conforming to PICMG 2.30.



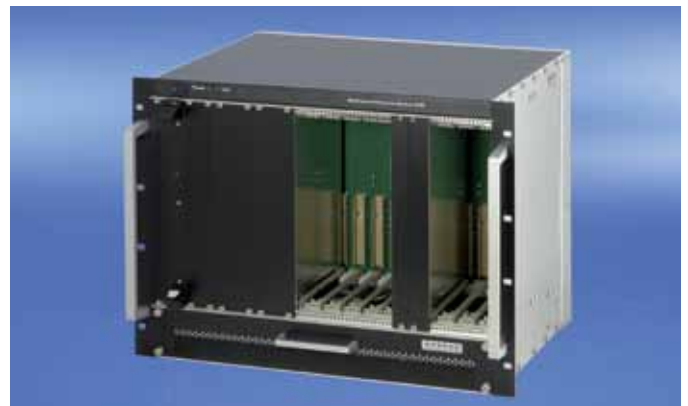
MicroTCA chassis with hot-swap fan unit and PSU.



MicroTCA system: 1 U for 6 single mid-size AMC modules: larger air inlet and exit surfaces are obtained through specially shaped side panels.



CompactPCI chassis with 48VDC power supply.

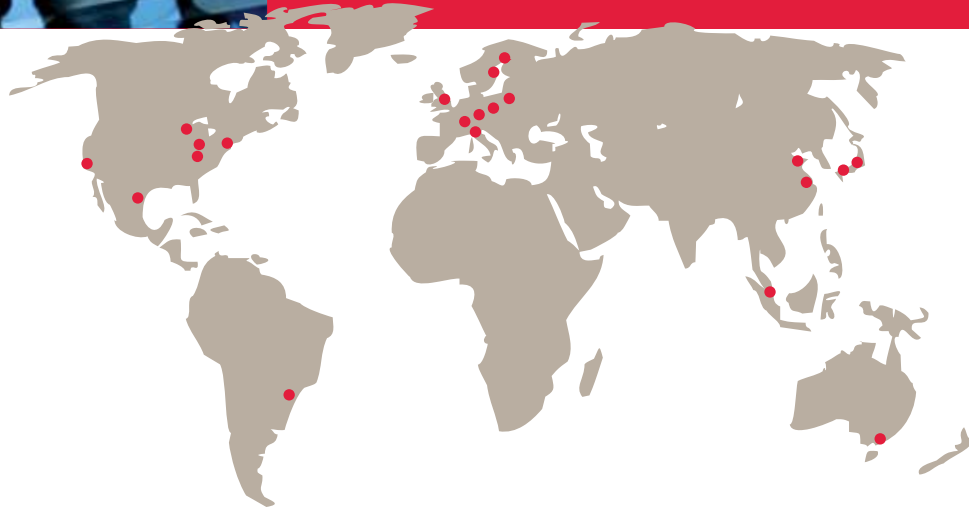


CompactPCI chassis with hot-swap fan unit and custom finishing.





We are where you are



Pentair
Technical Products



Schroff®

Birtcher®

CALMARK

Hoffman®

McLean
COOLING TECHNOLOGY

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