

Telecommunications



High-tech product platforms
based on global standards

- High-speed backplanes & pre-configured systems
- Cases & cabinets for electronics protection
- Energy-efficient cooling
- Rapid development of customised solutions
- Global manufacturing capabilities



Strong engineering core, renowned brands

Your partner for next gener



PENTAIR TECHNICAL PRODUCTS

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. With the highest level of quality, performance and aesthetics available in the market today, its industry-leading brands provide a broad variety of standard, modified and engineered solutions to the commercial, communications, energy, electronics, industrial, infrastructure, medical, and security and defense markets. When you partner with Pentair Technical Products, you join forces with a company that has the technical, production, and financial resources to design, manufacture, assemble and test your critical-use systems.



Pentair
Technical Products

www.pentairtechnicalproducts.com

Schroff®

www.schroff.biz

Schroff® has been a world leading brand in the electronics packaging industry for over four decades. Schroff® supplies subracks and accessories, instrument cases, 19" cabinets, backplanes, integrated systems and enclosure hardware, complete packaging systems for MicroTCA, AdvancedTCA, CompactPCI, PXI, VME, VME64x, VPX, VSX and customer-specific enclosure systems.

Birtcher®

www.birtcherproducts.com

CALMARK®

www.calmark.com

Calmark® and **Birtcher®** are industry leading brands in the design and manufacture of ruggedized components that hold boards in place and transfer heat in demanding and critical applications. Calmark® products include card guides, Card-Lok retainers, PCB retainers, and metal inserters / extractors. Amongst Birtcher® products are Wedge-Lok® retainers and conduction cooled frames.

McLean®
COOLING TECHNOLOGY

www.mcleancoolingtech.com/

McLean® with more than 30 years of experience producing everything from fan assemblies to standard air conditioners and heat exchangers to engineered cooling applications for one-of-a-kind systems, the Pentair Technical Products McLean brand has the people and products to deliver the cool.

Hoffman®

www.hoffmanonline.com

Hoffman® offers a broad range of enclosure designs and sizes for demanding environments. The range goes beyond electrical enclosures and includes thermal and condensation management products and a wide array of accessories.

Preface

High-tech product platforms, rapid development

ation telecom applications

Performance & speed for the telecommunications industry

Global competencies. Environmental commitment.

- Best-in-class engineering capabilities
- Manufacturing operations worldwide
- Global supply chain management
- ISO 9001:2008 quality
- Global program management
- Broad modification & engineered solutions capabilities
- System integration
- Sustainable environmental practices



CONTENTS

Pentair Technical Products & Brands	Page 02
Applications & Solutions	Page 04
System Platforms	Page 06
Outdoor Cabinets & Enclosures	Page 08
Cooling Solutions	Page 10
Backplanes & Power Supply Units	Page 12
Subracks, Cases & Front panels	Page 14
Indoor Cabinets & Racks	Page 16
IT Infrastructure Solutions	Page 18
Engineering Capabilities	Page 20
Customer-Specific Manufacturing	Page 22

Trusted protection for critical system applications

For more than 50 years we have claimed a leading position worldwide for the reliable and secure protection of electronic systems. Our decades of experience and leading-edge technology enable us to offer precisely what will help take you a step further: Outdoor and indoor cabinets, pre-configured systems and subracks, high-speed-backplanes and thermal management products for failsafe critical systems applications.

High-tech solutions on open standard platforms

Our comprehensive range of open standard products demonstrates our capabilities and ensures performance for ever more demanding communication applications. Our modular platform concept delivers COTS benefits such as speed-to-market and cost efficiencies while offering integrated solutions, engineered to meet your individual requirements providing a high level of technical dependability, extended performance and future-proof design that can be applied globally.



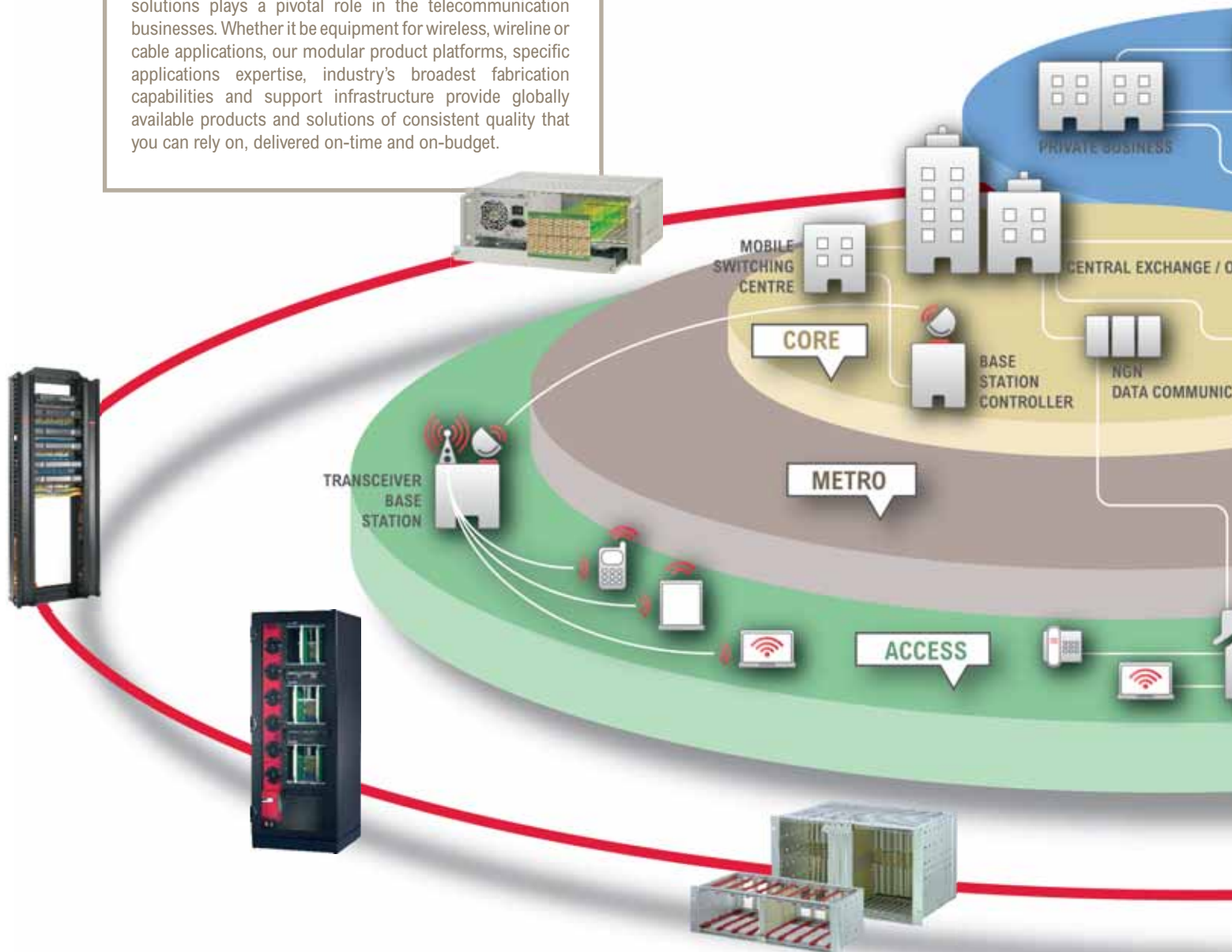
Enabling accelerated product deployment

Leading-edge technology

COTS-based products and systems solutions . . .

Efficient solutions for OEMs and telecoms

Rapid deployment of dependable high performance solutions plays a pivotal role in the telecommunication businesses. Whether it be equipment for wireless, wireline or cable applications, our modular product platforms, specific applications expertise, industry's broadest fabrication capabilities and support infrastructure provide globally available products and solutions of consistent quality that you can rely on, delivered on-time and on-budget.

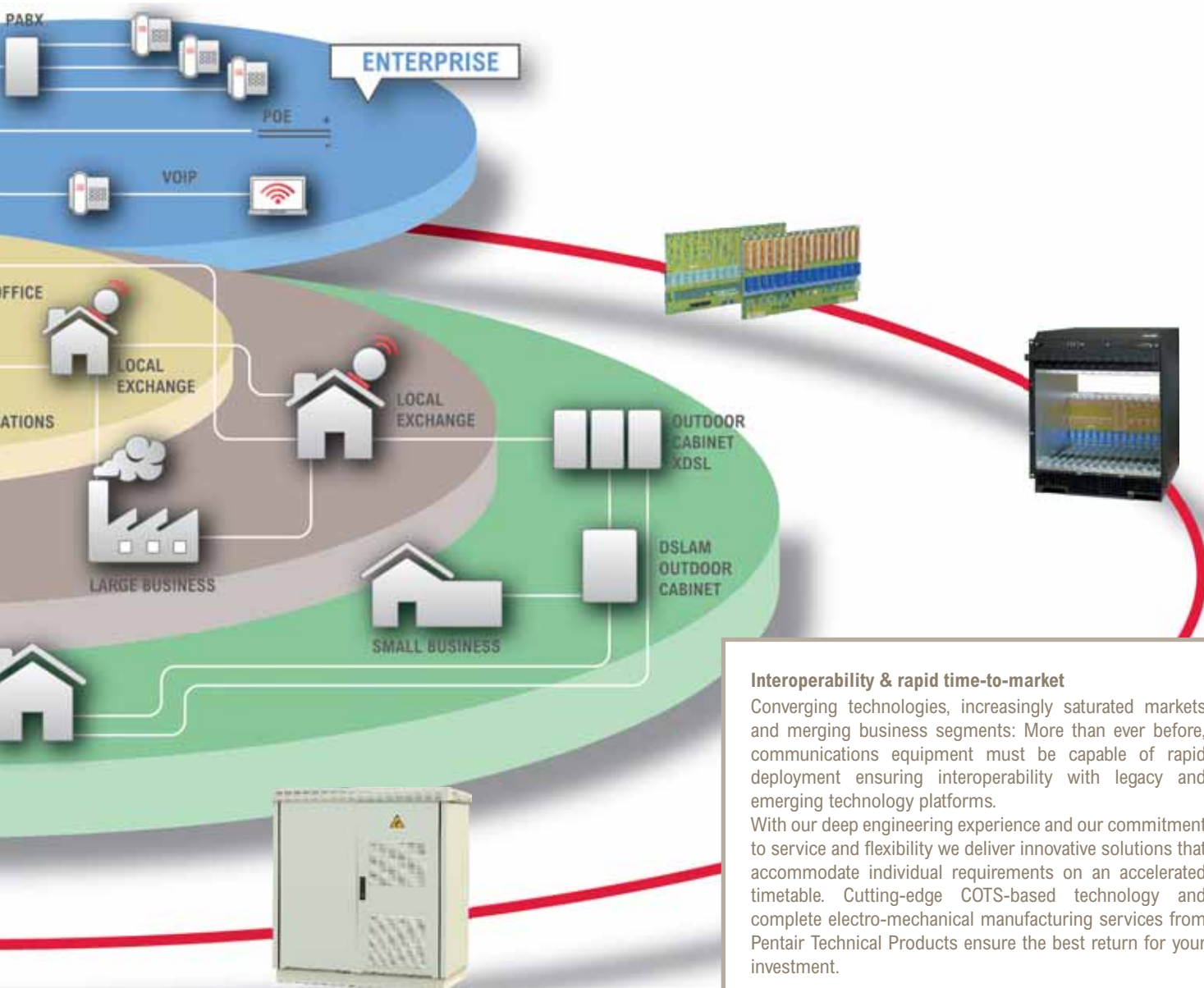


Our advanced solutions – offering best performance & quality

Ensuring carrier-grade quality

Rapid time-to-market

... for core, metro, access, and enterprise applications



Leading-edge technology, rapidly deployable

Open standard systems

AdvancedTCA, MicroTCA, CompactPCI



OPEN STANDARD PLATFORMS

Save development cost and be faster to market. No matter which architecture – open standard system platforms provide a modular approach for telecommunication hardware and architectures which support the latest data transfer protocols allowing for the development of the latest telecommunications systems. Your benefit: You bring new products to market more rapidly and without costly development and testing processes.



TECHNOLOGY OPTIONS:

PRODUCT	FEATURES												TELECOM NETWORK AREA
	Data transfer rate (Board to Board)		Topologies			Availability	Cooling per blade/slot			Blades / Slots		Hardware Management	
	40 Gb/s	1 Gb/s	Dual Star	Dual-Dual Star	Full Mesh	99,999 %	400 W	80 W	60 W	Board Space	Number		
AdvancedTCA	•	•	•	•	•	•	•	•	•	8U * 280 mm	14 / 16	Shelf Manager	CORE METRO ACCESS ENTERPRISE
MicroTCA	•	•	•			•		•	•	75/150 mm * 180 mm	12	Shelf / Carrier Manager	
CompactPCI with PSB		•	•						•	6U * 160 mm	24	Chassis Manager optional	

WORK WITH PENTAIR TECHNICAL PRODUCTS TO ACHIEVE YOUR ON-TIME, ON-BUDGET GOALS

Extensive in-house capabilities

Our worldwide experts have worked with global standards committees such as IEC, IEEE, VITA and PICMG for decades, defining the standards as a base for our customers' solutions. Many of the world's major providers of embedded systems for information, communication and security technologies rely on our vast experience, our extensive in-house engineering, test and R&D capabilities, and our operations providing maximum flexibility and speed of response. Our concept of lean and value engineering offers our customers total system competence and the confidence of knowing that both costs and quality are subject to the same fail-safe disciplines.

Dependable standard product platforms

Our wide range of standardised products, which cover most of the IEC, IEEE, PICMG and VITA specifications, is a great base for modifications and custom specific solutions that can be achieved quickly and cost-efficiently. All our products conform to the EMC and low-voltage guidelines of the EU and to the RoHS guidelines; many also to UL, MIL, NEBS, Bellcore and Telcordia standards. This incidentally reduces your outlay for design, verification and testing to a minimum. The result: Your time to market is considerably faster and at less cost.

Our systems – performance & reliability that exceeds

Why our systems make a difference

Integrated system solutions

Advanced solutions for all parts of the network



OUR TECHNOLOGY:

BACKPLANE DESIGN:

- 40G backplane design, according to IEEE 802.3ap specification
- Cost effective solution due to reduced layers
- Superior 40G signal integrity achieved with FR4 backplane material
- Continual R&D for signal integrity towards the 100G future requirements

POWER DISTRIBUTION & COOLING:

- Cooling capacity of 400 W or more per slot according to NEBS requirements (DeltaT = 10K, CP-TA level >= B4)
- Power distribution of 400 W or more per slot

SHELF MANAGEMENT:

- Interoperability tests with major board vendors allowing plug & play confidence
- Cooperation with development of specific firmware requirements along with software testing with all leading telecom companies
- Expertise in development and customer support

EXPERTISE IN MECHANICAL DESIGN:

- For decades, our experts are highly involved in the definition of standards such as for CompactPCI, AdvancedTCA and MicroTCA
- Large range of standard products covering the main market requirements, easily and quickly adaptable to individual applications/solutions
- Fast-to-market, leading-edge technology solutions that reduce your development, engineering and tooling costs
- Continual optimisation and value engineering with DVT testing and FMEA

OUR SOLUTIONS:

SWITCHING & ROUTING



10-Gigabit Ethernet Switch Applications in AdvancedTCA
Provision of project management support; thermal simulation, backplane simulation, design expertise for mechanical and electronic parts.

NEXT GENERATION NETWORKS



Intune Networks' Verisma platform features a highly distributed optical packet switching fabric based on the Schroff AdvancedTCA open standard product.

YOUR BENEFITS AT A GLANCE:

- **Quicker to market and at less cost:** Individual developments based on a broad standard product range
- **Dependable system function:** Mechanics and electronics are optimally matched to one another
- **Safety and protection:** EMC protection, shock and vibration resistance off-the-shelf
- **Most advanced technology:** Excellence in signal integrity, shelf management, power distribution and cooling

Advanced architecture, uncompromising security

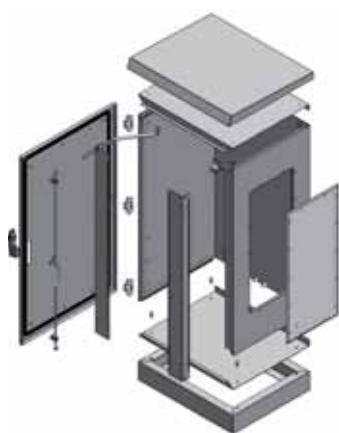
Outdoor cabinets

Protection, reliability and flexibility . . .

Save on development cost and be faster to market

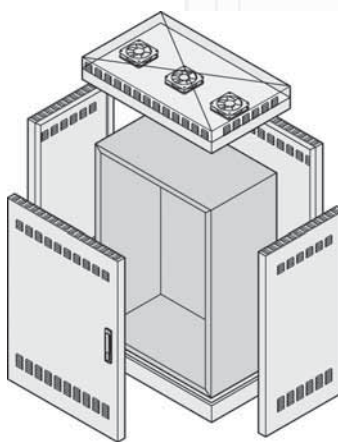
The fast-paced growth of the mobile telecommunications frontier demands rapid response, flexibility, intelligent design and the ability to evolve as technology changes. With Pentair Technical Products you have a partner that can make your concepts a reality.

Pentair Technical Products engineering experience delivers innovative solutions that fulfil and often excel emerging technology requirements. A commitment to service and flexibility facilitates solutions that accommodate customised requirements on an accelerated timetable. With our broad range of global fabrication capabilities and capacity we can provide platforms of consistent quality that you can rely on, delivered on-time and on-budget.



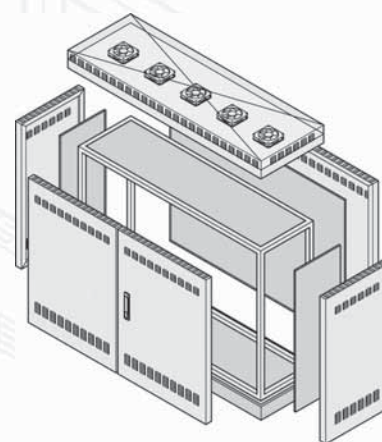
Comline: the single wall cabinet

- The budget-priced outdoor cabinet
- Aluminum, single-wall
- Thermal solutions available
- Wall, pole or floor mounted
- Locking systems



Unibody: simple and cost-optimized

- Mid-featured outdoor cabinet
- Aluminum
- Double-wall: cost-optimized inner enclosure, removable outer cladding for installation requirements
- Wall, pole or floor mounted
- Locking systems



Modular: highly flexible

- High-end outdoor cabinet
- Aluminum profile frame
- Removable double-wall cladding for easy access from all sides
- Flexible in design and dimensions
- High thermal management requirements
- Locking systems

Application:

Telecom such as xDSL, WiMAX, LTE, FTTx, 4G base stations, battery backup etc.

Our outdoor cabinets – reliability & security in the network

Why our outdoor cabinets make a difference ensuring carrier-grade quality

Integrated outdoor solutions

... for high-density, multi-technology installations



OUR TECHNOLOGY:

MECHANICAL ROBUSTNESS:

- Robust construction for loads of 400 kg or more
- Shock and vibration resistant to IEC 61 969-3, class 2
- Earthquake tested to IEC 61587-2

FLEXIBILITY:

- Flexible design within the standardised dimensions
- Flexible internals with 19", ETSI or other non-standard accessories
- Flexible installation (e.g. wall, pole and floor mounted)

THERMAL MANAGEMENT:

- Natural convection through double wall
- Expandable through fan(s), heat exchanger, air conditioner or thermoelectric cooler (see pages 10 to 11)

SHIELDING & PROTECTION:

- EMC shielding & protection against dust, water and corrosion
- Protection IP55 to IEC 60 5029
- IP protection, along with EMC properties can be selected

CUSTOMISATION:

- Different materials, custom-specific and anti-graffiti paint
- Custom locking/security requirements and monitoring systems
- Customised internal design for equipment, connections etc.

VDSL2- fibre to the curb, copper to the individual home, provides triple/quad play to subscribers.

OUR SOLUTIONS:

BASE STATIONS – CORE/METRO



Battery and auxiliary power equipment enclosures
Modular design allows to add bays to meet capacity;
climate control for extended equipment & battery life;
EMI/RFI shielded, separate compartment for breaker panels plus cable management facilities

NGN - 4G – METRO/ACCESS



YOUR BENEFITS AT A GLANCE:

- **Advanced cabinet architecture:** Platform flexibility, with cable, power and thermal management
- **Unmatched product development:** Platform flexibility, extensive in-house fabrication and full integration, complete co-development and custom design capabilities
- **Global presence:** Manufacturing capabilities and capacity to deliver proven, tested and robust OSP enclosure and thermal solutions for any size deployment on any schedule, worldwide support and logistics

Global availability, global service

Cooling products

Standards conformance, high performing & energy efficient



Strong brands, global support

With strong brands such as Hoffman®, Schroff® and McLean®, Pentair Technical Products is the industry's leading thermal management provider offering the broadest thermal management experience, as well as the engineering resources, test lab capabilities and products that reduce costs and increase system performance and reliability.

Leading technology, dependable testing

Based on standard product platforms, our thermal management products can be configured exactly to your specific requirements assisting you to maintain peak internal temperatures at levels just below those prescribed by the OEMs. Exclusive on-site UL certified test lab and compliance with IEC, UL, Telcordia specifications; EMC testing included.

Engineered solutions, exactly to your needs

Pentair Technical Products cooling experts work closely with your project team to design, develop and manufacture engineered thermal solutions to your exact specifications. Engineered units are available with AC and DC high-efficiency air movers or DC-only with a battery backup. We offer corrosion-resistant designs and finishes such as conversion coating, powder paint and chromate. Intelligent controls can be added with functions you specify, including speed control, fault indication, diagnostics, power conditioning, filtering and RS232 and I2C communications. Using proprietary software to develop custom heat exchanger prototypes, we can test several unit dimensions and predict performance prior to build.

Outdoor enclosure air conditioners:

- Cooling performance from 230 to 17300 watts in 115, 230 and 400 VAC specified by UL
- Operation temperature range -40 °C to +55 °C
- Corrosion resistant components
- Telcordia GR-487 capable
- Dual condenser-side air movers for performance redundancy
- Mal-function switch and heater package



Outdoor heat exchangers:

- Operating temperature range -40 °C to +65 °C
- Removes up to 3000 watts of enclosure heat
- Available in DC and AC power supply
- Cooling capacities ranging from 25 W/°C and 150 W/°C
- Variable-speed blowers standard on DC-powered units
- Surface and recess-mount capable
- Closed-loop cooling
- UL/cUL listed, UL file No. SA7402



Thermoelectric cooler:

- Compact low-profile coolers for small indoor and outdoor enclosures
- From 60 to 200 W cooling power using Peltier effect
- Contains no refrigerant
- No condensers, compressors or filters required
- Operating temperature range -40 °C to +55 °C



Our cooling solutions – efficiency & reliability on demand

Why our cooling products make a difference

Cooling solutions

Made for extreme conditions



OUR TECHNOLOGY:

STANDARDS CONFORMITY:

- CE, UL type 12/3R/4
- RoHS
- Type 4/Telcordia GR-487 capable
- GOST

PERFORMANCE:

- Operation temperature range -40 °C to +65 °C
- From 60 to 17300 watts (see pages 18 to 19 for 40 kW and above solutions for indoor cabinets)
- 115, 230 and 400 VAC
- 24 and 48 VDC

PERFECTION:

- Efficient cooling optimised by air measurements and heat simulations in a climate controlled laboratory

MECHANICAL DESIGN:

- Robust all metal construction for rugged factory and outdoor environments
- Corrosion resistant components
- Simple installation and mounting flexibility

Base station controller cooling solution

McLean engineered Air Conditioner / Heat Exchanger solutions, proven, environmentally friendly components, energy efficient, low-noise, reliable cooling. Electronic cooling control system with multiple sensor monitoring and reporting of cooling status, faults and remote communications.

OUR SOLUTIONS:

CORE / METRO / ACCESS



CORE / METRO / ACCESS



Base station controller cooling solution

McLean engineered cooling unit UL, cUL, CSA, Bellcore, NEMA, IEC, European Safety and FCC compliant. An energy-efficient rotary compressor and new earth-friendly refrigerant provide reliable cooling in rugged outdoor environments. All models are built with corrosion-resistant components

YOUR BENEFITS AT A GLANCE:

- **Quicker to market and at less cost:** Individual developments based on a broad standard product range, large program of stock items available
- **Global presence, global service:** Comprehensive after sales services with worldwide support
- **Dependable quality:** Rapid prototyping and superior testing capabilities, 100 % final check and function testing
- **Design to your exact specifications:** Advanced software, rapid prototyping and in-house test facilities
- **Efficiency and reliability:** Extended life and increased reliability of electronic components

Sophisticated products, superior performance

Backplanes & PSUs

A huge program for the telecommunications market . . .



BACKPLANES

Huge range of standard backplanes

Our broad range of standard backplanes is a great base for modifications and custom specific adaptations. In addition to reduced development costs, you also profit from short development and manufacturing times. This incidentally also reduces your outlay for verification and testing to a minimum, as we have already conducted tests on many of our off-the-shelf products. The result: You go to market considerably faster and at less cost.

Competence for new developments

Schroff is the expert in highly custom backplane design, especially for high speed data transfer. If your requirements cannot be met with standard products or modified standard solutions, our qualified and experienced team will create a customised solution for your system. We have all the necessary development and manufacturing competencies gathered under one roof, so making our processes fast and efficient.

Conformal coating

To protect them from humidity, fungal infestation and condensation, we can cover our backplanes and power supply units with a special lacquer - the conformal coating.



POWER SUPPLIES

Only best components

Schroff also offers you the best components in the area of power supplies. Our power supply units have a wide-range input of 16 to 154 VDC and cover all voltage ranges for applications in several DC environments. They are also extremely reliable, even through a temperature range of -40 °C to +85 °C.

CompactPCI with Packet Switching and/or Computer Telephony bus:

- Special monolithic backplanes including power slots for 1 to 4U systems with horizontal card cage
- 2, 4 and 6 slot CompactPCI backplanes with different options like PSB and H.110 or only PSB or only H.110
- No tantalum or electrolytic capacitors to avoid the possibility of fire in overvoltage or wrong polarity situation

AdvancedTCA / MicroTCA:

- State-of-the-art high speed backplane design that supports 40G (in accordance to IEEE802.3ae and IEEE802.3ap)
- Optimised routing strategies to minimise the number of layers and avoid the need of low loss PCB material
- Dual Star, Full Mesh and Replicated Mesh versions of AdvancedTCA backplanes
- Star and Dual Star MicroTCA backplanes



CompactPCI power supplies:

- Complete product portfolio of pluggable PSU's for CompactPCI applications (3U and 6U / AC & DC inputs)
- Redundancy with current share bus

Power systems:

- Redundant and uninterruptible DC power supply with battery backup
- Operational status signalling via LED display and potential-free relay contacts

Our backplanes – high-speed serial data communication

Why our backplanes and power supply units make a difference

Customised solutions

... powerful and future-proof designed



OUR TECHNOLOGY:

HIGH-SPEED BACKPLANE DESIGN:

- 40G backplane design, according to IEEE 802.3ae and IEEE 802.3ap specification
- High speed backplane simulation with Ansoft Designer, ICAP/4 SPICE Simulator and Matlab
- Better signal integrity: verification with Agilent Time & Frequency Domain Measurement equipment
- Cost effective solution due to reduced layers

POWER SUPPLY:

- Scalable power systems for your specific application
- Reliable and energy efficient solutions

PRODUCT QUALITY:

- In-house conformal coating process for backplanes and PSUs installed in harsh environments
- Backplane process tests: automated optical inspection, continuity and functional tests
- Extensive PSU testing: in-house DVT test capabilities, burn-in test, thermal verification and EMC tests

OUR SOLUTIONS:

SWITCHING & ROUTING



METRO APPLICATIONS



NEXT GENERATION NETWORKS



YOUR BENEFITS AT A GLANCE:

- **Quicker to market and at less cost:** Individual developments based on a broad standard product range, superior price-performance ratio
- **Most advanced technology:** Excellent high-speed behaviour, proven in various simulations and measurements and in wide range of applications
- **Safety and protection:** EMC protection, environmental, shock and vibration resistant solutions

Technical benefits, economic advantages

Standard product platforms

Subracks, 19" chassis, system cases, front panels . . .



Subracks, chassis, system cases: market-leading product range

With their modular construction for housing euroboards they offer you many advantages, both technical and economic. The standard components allow versatile combinations, letting you implement a range of versions varying in height, width and depth, simple and cost effective and with none of the costs associated with design outlay.



19" chassis: flexibility for non-standard components

To optimise the accommodation of non-standard components we have developed a robust and versatile 19" chassis, the multipacPRO (1U to 5U). Where tricky space or mounting issues would otherwise arise, you can now fit your non-standard components, electrical components and power supply units with ease. The well-designed expansion kits also accept standard board formats. Thanks to its simple yet versatile construction, together with a variety of expansion options, optional HF shielding and even mounting on telescopic rails, multipacPRO scores high in many applications. We can also offer you a low cost sheet metal solution that is particularly suitable for customised solutions.

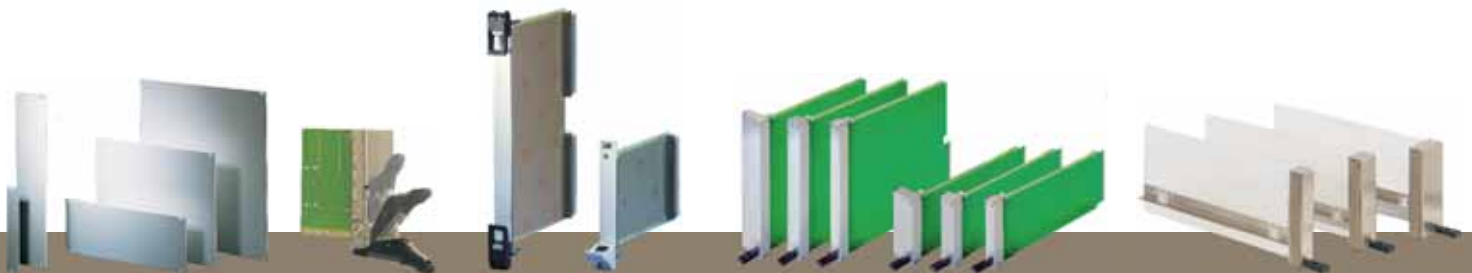


Front panels

EMC shielded or unshielded, flat or U-shaped, aluminium or stainless steel – you decide on the best finish for your application. A large range of lever and static handles ensures that functionality does not have to be without convenience. With the rapid “front panel express” service from Schroff your development and time-to-market delivery for customised, modified or screen printed front panels will be greatly improved.

FRONT PANEL EXPRESS.

Cut-outs for connectors, LEDs, handles, switches, and screen printing – the front panel strongly determines the appearance of a case or subrack. With Front Panel Express you can give your front panels an individual configuration. Fast delivery from two days. More information at www.frontpanelexpress.eu



Mechanics from Schroff – the market-leading range

Why our products make a difference

Customised solutions

... flexible and fast, starting from quantity 1



OUR TECHNOLOGY:

CHASSIS DESIGN:

- Modular concept for small to mid-size quantities
- Sheet metal concepts for mid to high volume projects
- Available in ETSI or 19" dimensions

SURFACE TREATMENT:

- Standard passivated surface treatment
- Individual surface treatments such as yellow chromate available or to customer specific requirements

SHIELDING:

- EMC shielded standard solution

EXPERTISE IN MECHANICAL DESIGN:

- Large range of standard products covering the core market requirements, easily and quickly adaptable to individual applications
- Flexible platforms for modular prototypes and mid-size volumes
- Value engineered solutions

OUR SOLUTIONS:

ENTERPRISE APPLICATIONS



NEXT GENERATION NETWORKS



TEST & MEASUREMENT



OUR
TECHNOLOGY
SOLUTION

YOUR BENEFITS AT A GLANCE:

- **Safety and Protection:** EMC protection, shock and vibration resistance off-the-shelf
- **Mix and Match:** One standard platform; a thousand options; mechanical basis for all systems and your individual application
- **Speed and Service:** Front Panel Express service and express assembly services for subracks and cases

Broad standard product range, individually configured

Open standard cabinets

VARISTAR, ETSI & 19" racks



VARISTAR: the versatile and economic platform

VARISTAR is the future-proof solution for the fast-moving telecoms market, cost effectively and simply configurable to global project specific requirements: As a universal cabinet platform with modular components, VARISTAR is capable of practically everything. With its compatibility with both metric (ETSI) and 19 inch standards, its mechanical robustness for use in seismic (earthquake) zones, its shielding and efficient and effective cooling and its capacity to combine multiple requirements, VARISTAR is so adaptable that you can use a single product to meet all these requirements. By reducing the variety of different cabinets in use, VARISTAR simplifies your logistics processes and installation tasks. It thus helps you to reduce procurement costs from day one.

19" 2/4 post rack: the practical and economic cable/fibre management system

With its functional slim design the 19" post rack provides a cost effective but highly reliable solution for any telecom network requirement: The frame and the accessories have been specifically developed to meet the key requirements for managing cable/fibre optics. Fibre optic bend radius protection, cable routing paths providing cable and connector accessibility as well as physical protection are all part of the advantages of the 2/4 post rack. All these features are available from stock.

ETSI rack: the metric solution for public and private networks

Conforms to IEC 48 D and ETS 300 119 the Schroff ETSI rack provides a static load-carrying capacity up to 200 kg. If you require specific features or dimensions, our engineers will support you with customised solution services.



19
104,8

Our indoor racks & cabinets - certified reliability and quality

Why our cabinets make a difference

Integrated cabinet solutions

Efficient solutions for core, metro and access applications



OUR TECHNOLOGY:

MECHANICAL ROBUSTNESS:

- VARISTAR provides up to 1.000 kg static load
- Shock and vibration resistant to DL6 in accordance with IEC 61587-1 and IEC 60068-2-6
- High mechanical stability to earthquake zone 4 in accordance with IEC 61587-2

EMC PROTECTION:

- Superb performance: 60 dB at 1 GHz, 40 dB at 3 GHz

COOLING:

- Variable cooling concepts up to 40 kW
- Reliable and energy efficient standard and customised solutions

COMPLYING WITH STANDARDS:

- Tests completed to the 19" standards (IEC 60297-2), EN 60529, EN 50298, IEC 60601-1
- Complies with ETS and IEC 61587
- Complies with ETSI, 19" (IEC 60297-2) and NEBS standards in a single cabinet

CABLE MANAGEMENT:

- Extensive and innovative accessories for well-organised cable and fibre management

OUR SOLUTIONS:

TELECOM NETWORK CABLE MANAGEMENT SOLUTIONS



NEXT GENERATION NETWORKS



OUR
TECHNOLOGY
SOLUTIONS

YOUR BENEFITS AT A GLANCE:

- **Quicker to market:** Broad standard product range, quickly adaptable to individual needs
- **Design that caters your needs:** Modification services and expertise for custom specific solutions
- **100 % quality and reliable system function:** Expertise in mechanical design, cooling, monitoring, and power distribution

Why our datacom products make a difference

Datacom products

Modular, compatible and scalable . . .



As individual as you require

Whether you are upgrading a data centre or building a new one it is the same: With our multifunctional product platform we offer what you have come to expect from Schroff - a total solution, tailored to suit your needs exactly and in which all the components work perfectly together. Why can we do this? Because we adapt our solutions individually to your needs and not your needs to our solutions.

Monitoring

Whether you need to monitor single operating parameters or implement a centralised software platform, open interfaces of the monitoring modules and consolidating software platform give you flexibility.

Monitoring



Cooling solutions

Modular containment solutions or water cooled cabinets – where maximum efficiency is of the essence, our climate control solutions deliver, requiring a minimum of energy and growing to match your future needs.

Cooling Solutions



Power distribution

In datacom technology, both power density and power losses increase progressively. Schroff's modular socket strip program supports you when planning your current supply, taking in consideration your individual requirements and needs.

Power Distribution



IT-Infra

KEY FEATURES AT A GLANCE:

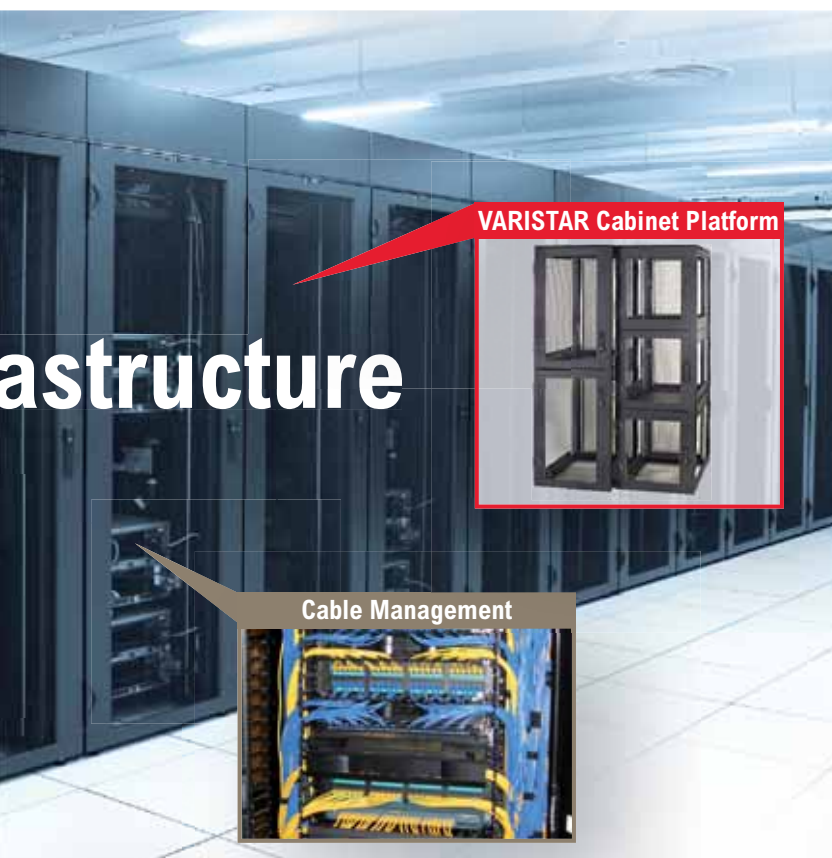
- **Flexibility:** Optimal room use through 100 different cabinet configurations
- **Efficiency:** Air/water heat exchanger with minimal energy consumption and minimal noise, utilising the smallest floor area
- **Availability:** Sensors and security components to monitor critical parameters for continuous availability and reliability

Our datacom technology – efficiency, flexibility & security

Key engineering benefits

IT Infrastructure solutions

... from components through to complete solutions



Upgrades in a logical way

From our experience as a partner to data centre designers and users, we anticipate further growth of your data centre size and requirements. Our solutions are therefore designed from the ground up in a way that allows us to respond to your growth and expansion requirements. Our range includes server and datacom cabinets, climate control systems, power supply systems (UPS), cable/fibre management, monitoring and accessories; the modularity, compatibility and scalability of all necessary components enable you to increase your data centre capacity, fast and with simplicity as your requirements grow.

Service and support

Schroff service and support does not end at the design stage. It continues with professional assembly and integration through to delivery and commissioning of your system. We provide further support for spares and repair for the life of your program.

VARISTAR cabinet platform

Server and networking cabinets are the future-proof solution for the dynamic datacom infrastructure. There are many different versions and the comprehensive range of accessories will equip you for tomorrow's challenges today.

Cable management

Four defined zones ensure cable/fibre management that is simple, secure for all types of cable/fibre. What is more, the cleverly-designed cable zones keep data and power cables securely separate.

YOUR BENEFITS AT A GLANCE:

- **Thermal management expertise:** Decades of experience with cooling solutions
- **Efficient technology:** Faster to market with standard product platforms
- **Individual solutions:** Customer-specific configurations based on a broad standard product range



Leading the way in high-speed data transfer technology

Engineering capabilities

Mechanics and electronics . . .



Leading the way in global standards

Rapid introduction to market without costly development and testing processes – with this aim in mind our worldwide teams of experts have worked in the global standards committees such as IEC, IEEE, VITA and PICMG for decades. As a pioneer and innovator in electronics packaging components, systems and fully integrated electro-mechanical solutions our name has been synonymous for over 50 years with competence in the areas of mechanics, electronics, climate control and system management.

Outstanding research and development

Our comprehensively equipped R&D teams act as a central resource within the Pentair Technical Products group. It is our policy to extend the R&D team involvement throughout the product manufacturing cycle allowing our customers to benefit from all the latest advances in product, materials, procedures and technology.

High-tech solutions, reduced time to market

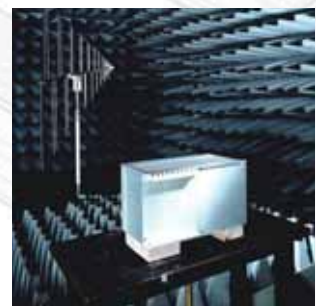
From conception to prototype construction, testing to certification, sales to project management and pre-production through to manufacture, we remain your reliable partner offering a product range that conforms to the standards and high-value technical requirements that allow you to introduce your product to market before your competition.

All resources under one roof

The parallel development of the mechanical and electronic components ensures their perfect integration together and also allows for shorter development times – we are also able to review the critical factors for the trouble-free functioning of the overall system. To provide this service we have all the necessary development and manufacturing competencies gathered under one roof.

Responsible for a global customer base

Serving many of the world's leading OEMs, our operations are geared to providing maximum flexibility and speed of response – for the rapid and efficient realisation of technological advances and product innovations for our customers' benefit.



Our resources & capabilities – exceed your expectations

Reducing total cost of ownership

System competence

... from a single source

Layout & design: 100% expertise

We have established an outstanding reputation for the quality and scope of our technical and industrial design. By applying the DFMA principles from the earliest concept stage and combined with the benefit of fully integrated facilities, concept development, CAD modelling and full-scale prototyping and evaluation can be successfully achieved within narrow time constraints. Your benefit: You bring new products to market more rapidly – and at a significantly more competitive unit cost.

Modeling, simulation and measurement: 100% quality

One thing remains top priority at every stage of development: the continuous assurance of 100% quality. With the most up-to-date modeling and simulation tools, measurement instruments and in-house-designed high-performance test adapters we optimise the development process and ensure offering only the best and highest-performance products. We also cooperate with certified testing and compliance test institutes.

Extensive standard product testing: 100% dependability

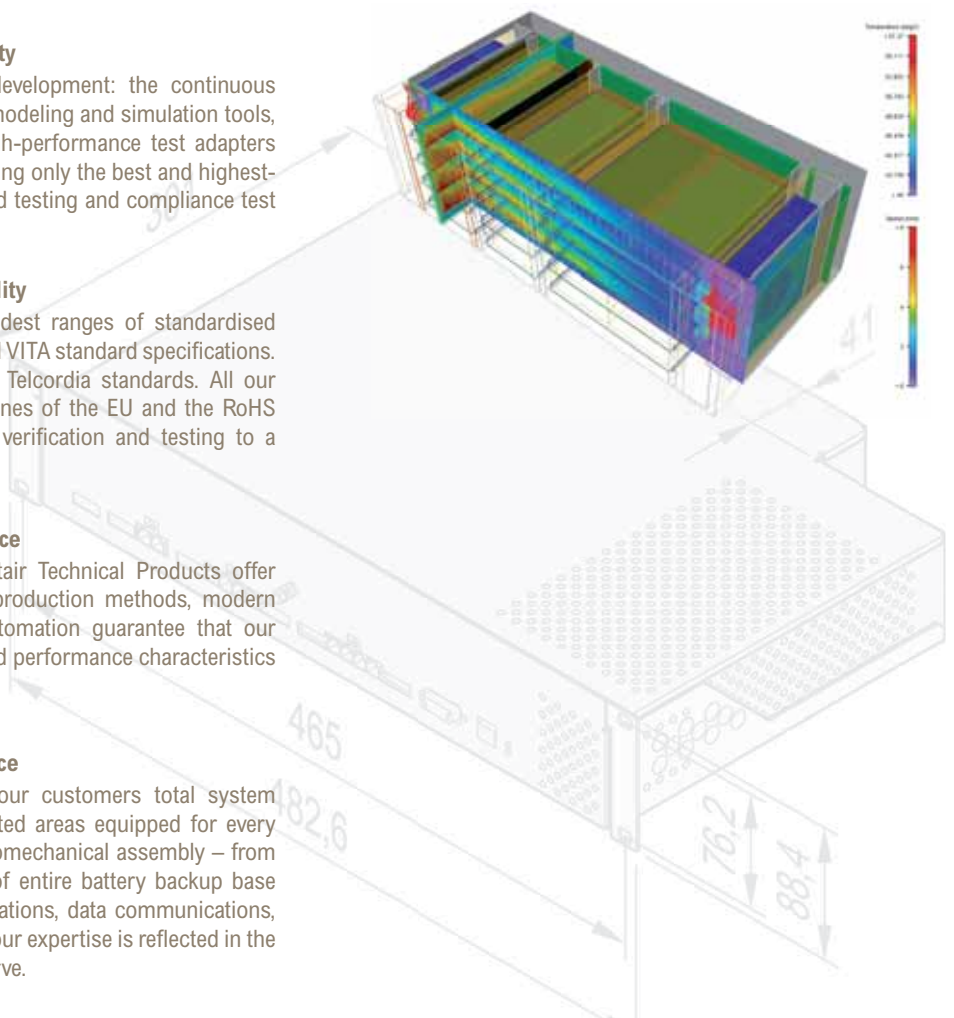
Our customers can take advantage of one of the widest ranges of standardised products, which cover most of the IEC, IEEE, PICMG and VITA standard specifications. Many also conform to UL, MIL, NEBS, Bellcore and Telcordia standards. All our products conform to the EMC and low-voltage guidelines of the EU and the RoHS guidelines. This incidentally reduces your outlay for verification and testing to a minimum.

Fully integrated global sites: manufacturing excellence

With fully-integrated global manufacturing sites Pentair Technical Products offer an outstanding broad product capability. Innovative production methods, modern manufacturing technology and a high degree of automation guarantee that our product offering assures the consistent high quality and performance characteristics demanded in telecommunication applications.

Value engineering capability: total system competence

Our concept of lean and value engineering offers our customers total system competence. All our manufacturing sites have dedicated areas equipped for every type of electronic/electrical interface wiring and electromechanical assembly – from the fitting of simple connectors to the construction of entire battery backup base stations. From telecommunications, mobile communications, data communications, cable telephony to security and defence – the extent of our expertise is reflected in the wide range of specialised applications our products serve.



Control

Fully tested and ready to install assemblies

Customised manufacturing

Reliable processes, reduced costs . . .



Specialist outsourcing service

As a pioneer and innovator in electronic packaging solutions, we are committed to providing leading edge technology and high quality products. By understanding our globally active customers' need for flexibility and performance we are also offering the production of customer-specific solutions. With fully tested and ready-to-install mechanical and electromechanical assemblies built to your specifications, Pentair Technical Products helps you to improve your cost-effectiveness by allowing you to operate leaner and focus on your core competencies.

Dedicated program management

Experienced and dedicated program management teams work closely with you, right from the consulting phase of a project. Fully committed to your objectives this team will continuously control the engineering and manufacturing process which guarantees excellent performance, cost efficiencies and timely deliveries to meet your expectations. With schedule visibility, quality management and well-defined communications tools in place, you can rest assured that the project is running smoothly.

KEY PROJECT PARAMETERS:

- Right from the start of a project, our experienced project management teams work closely with you.
- We design or re-engineer your design to save costs and to integrate into our manufacturing techniques.
- We create work instructions and final assembly drawings.
- We keep all documents under an electronic document management system.
- We manufacture completely to ISO standards and procedures.
- With our dedication to lean manufacturing techniques and process optimisation we reach the optimum solution for you, flexibly, fast, consistently and cost-effectively.

	FABRICATION CAPABILITIES							System Integration	Capacity
	Steel	Aluminum	Stainless Steel	Stamping	Chassis Assembly	Testing	Finishing		
AMERICAS									
Anoka, MN, USA	•	•	•		•	•	•	Level 1-4	720,000 sq ft (66,890 sq m)
Mt. Sterling, KY, USA	•		•				•	Level 1-2	310,000 sq ft (29,000 sq m)
Warwick, RI, USA	•	•	•		•	•	•	Level 1-5	170,000 sq ft (15,794 sq m)
San Diego, CA, USA		•		•	•	•		Level 1-5	60,000 sq ft (5,574 sq m)
Reynosa, Mexico	•	•	•	•			•	Level 1-2	325,000 sq ft (30,193 sq m)
Boituva, Brazil	•	•	•		•	•	•	Level 1-4	170,000 sq ft (15,794 sq m)
ASIA / NEAR EAST									
Qingdao, China	•	•	•	•	•	•	•	Level 1-3	60,000 sq ft (5,574 sq m)
Meiwa, Japan	•				•	•		Level 1-3	40,000 sq ft (3,716 sq m)
Bangalore, India	•						•	Level 1-3	75,000 sq ft (6,968 sq m)
EUROPE									
Straubenhardt, Germany	•	•	•	•	•	•	•	Level 1-3	577,000 sq ft (53,605 sq m)
Dzierzoniow, Poland	•	•		•	•	•	•	Level 1-3	110,000 sq ft (10,219 sq m)
Betschdorf, France	•	•	•		•	•	•	Level 1-3	205,000 sq ft (19,045 sq m)

Our advanced solutions – offering best performance & quality

Enabling lean processes, improving your cost-effectiveness

World class global partner

... flexibility & consistency

Proven processes for precision assemblies

From concept through to design, from assembly through to testing – from small to high volume production, we have all the necessary development and manufacturing competencies gathered under one roof, so making our processes fast and efficient.

Complete, fully tested, ready-to-install

Our business model not only allows us to produce, assemble and test all the components that are commonly needed in the telecom industry. It also guarantees that our offering assures the consistent high quality and performance characteristics demanded in telecommunications applications.

KEY COMPONENTS INCLUDE:

- Product prototypes
- Mechanical, electro-mechanical products and test fixtures
- Chassis and card assemblies
- Test stations or electronic test racks
- Through-hole and surface mount backplane assembly for prototypes and low volume runs
- RF / coaxial cable termination capability
- Fibre optic connector test cell and various test adapters

Flexible parts procurement

As a large global organisation we utilise our procurement power to benefit you with reduced costs of purchased parts. Or you procure the parts and we only provide the labour – whatever you prefer.

Component obsolescence management

We have the strategy and tools in place to routinely identify current or pending obsolescence problems and to help you resolving obsolescence issues and determine alternatives.

RELIABILITY YOU CAN TRUST

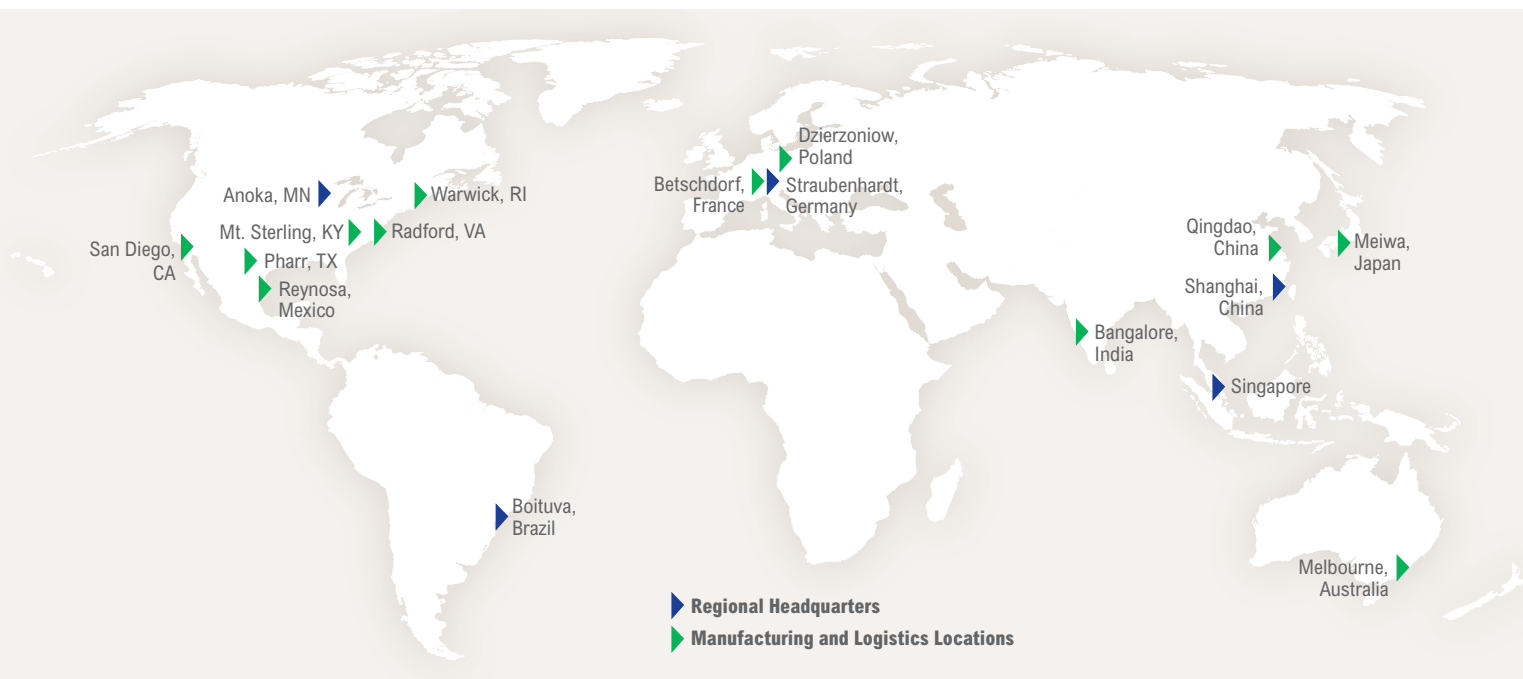
When you partner with Pentair Technical Products, you join forces with a company that has the technical, production and financial resources to design, manufacture, assemble and test your critical-use systems. We rely on our in-house engineering and manufacturing know-how, rapid development and production turn-around, fast delivery and program management to build complete customer confidence. So you can be assured, as other major OEMs have proven, that entrusting your project to us is the right decision.

YOUR BENEFITS AT A GLANCE:

- A superior-quality product at a reasonable price
- Quick turn-around for prototyping and developmental designs
- Benefitting from economies of scale unavailable to individual companies
- Reduced time to market through additional capability by Pentair Technical Products
- Flexibility for managing permanent increase or decrease in production while focusing on your core competencies

About Pentair Technical Products

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. Its industry-leading brands – Hoffman®, Schroff®, McLean® Cooling Technology, Calmark®, Birtcher®, Aspen Motion Technologies™ and Taunus™ – provide a broad variety of standard, modified and engineered solutions to the commercial, communications, energy, general electronics, industrial, infrastructure, medical, and security and defense markets.



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