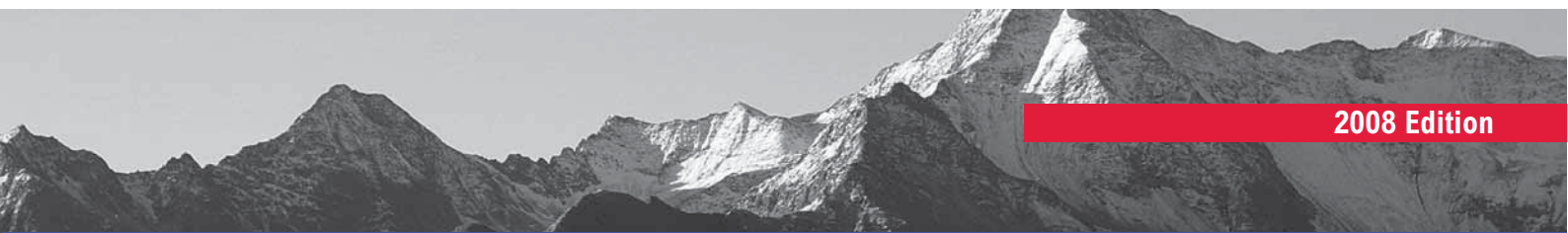
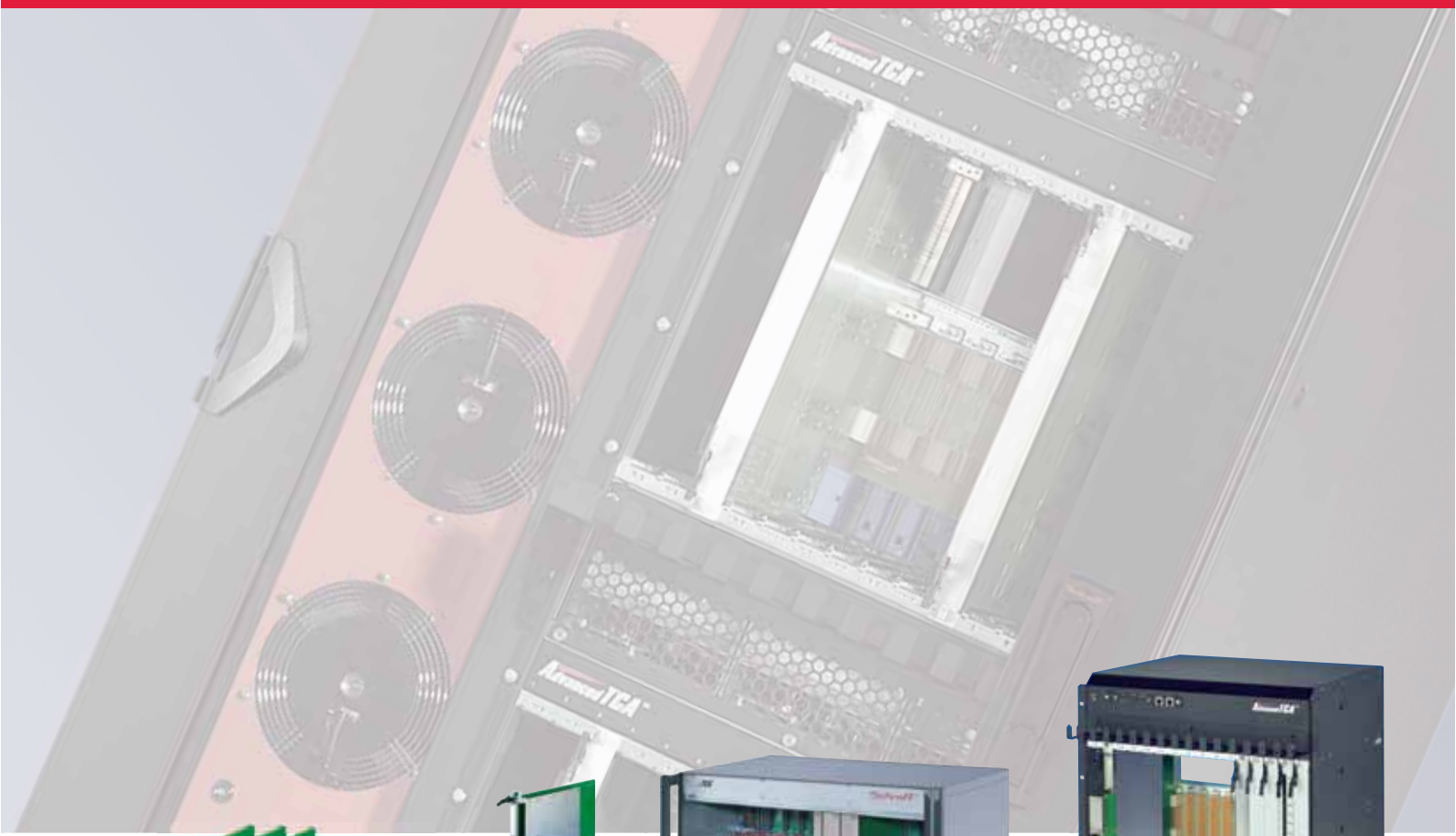


**Advanced TCA®**

**μTCA™**

**Advanced MC™**

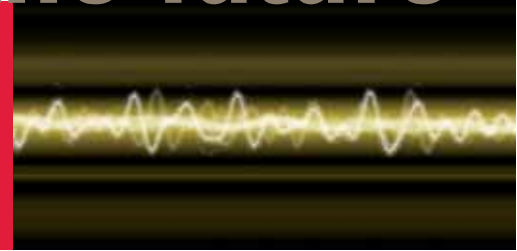
# PACKAGING SOLUTIONS



2008 Edition

New technologies: in safe hands with the right partner

# Programmed for the future

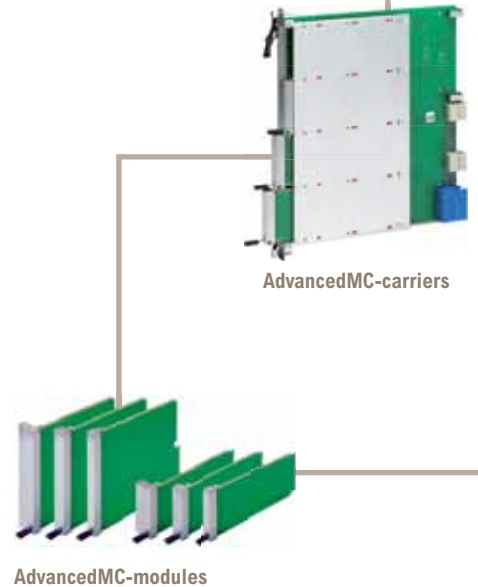


## CONTENTS

Overview .....	Page 2
AdvancedTCA .....	Page 4 / 18
MicroTCA .....	Page 6 / 52
AdvancedMC .....	Page 8 / 68
Applications .....	Page 10
Systems, Chassis .....	Page 12
Backplanes, Shelf Manager .....	Page 14
Cooling systems .....	Page 16
Internet .....	Page 80
ServicePLUS .....	Page 82
Standards .....	Page 84

For over four decades Schroff has been a world leader among developers and manufacturers of electronics packaging components and systems. Whatever demands you have to meet, together we will find the right solution for you. Our products combine the know-how of our specialists in the integration of mechanical, electronic and climate-control systems with many years of experience with the most varied applications in all environments. As a provider of complete solutions we deliver fully-equipped and tested systems from a single source, and continue to do so in the way that you expect of us. Tailor-made to precisely suit your requirements.

In these times of global competition we are all under the same obligation to optimize processes and to reduce costs. Our systems and complete solutions are based on globally standardized product platforms that support fast, future-proof and cost-effective development. Through design, project management, prototype and model construction, testing, certification, pilot and production manufacturing, plus comprehensive after-sales services, we take responsibility for your processes. And that is not all: we remain by your side as your dependable partner throughout the entire life cycle of your products.



## The yardstick for high-speed data traffic

# AdvancedTCA, MicroTCA and AdvancedMC



AdvancedTCA

**AdvancedTCA**<sup>®</sup>

AdvancedTCA stands for Advanced Telecom Computing Architecture and is the first standard among manufacturers and applications for very high data traffic and new communications services in the telecommunications sector. AdvancedTCA was adopted in December 2002 by the PICMG (PCI Industrial Computers Manufacturing Group). AdvancedTCA boards are capable of transporting, processing and analyzing large volumes of data at the speeds required by today's applications.



MicroTCA

**μTCA**<sup>™</sup>

MicroTCA stands for Micro Telecom Computing Architecture and is a modular standard for small, flexible system solutions. Its high scalability allows the application to be perfectly adapted to various requirements. For this reason, MicroTCA is being used increasingly in both telecommunications and all other areas of application. MicroTCA was adopted by the PICMG in 2006.



MicroTCA

**AdvancedMC**<sup>™</sup>

AdvancedMC stands for Advanced Mezzanine Card and is an important component of the AdvancedTCA platform. The specification was agreed by the PICMG in 2004. AdvancedMC modules are compact, versatile modules that extend the performance of AdvancedTCA systems and are installed using corresponding adapters, AdvancedMC carriers, to AdvancedTCA systems. AdvancedMC modules are also used in conjunction with the recently defined MicroTCA systems. Here, however, they are plugged in directly (without carrier) and are simultaneously boards for MicroTCA.



Free resources for your core competencies

# AdvancedTCA – one standard

## The system platform for communications infrastructure

- Standardized systems for rapid product introduction
- Highest flexibility and economy
- Future-proof: equipped for the future board generation



### AdvancedTCA – the PICMG 3.0 specification.

Advanced Telecom Computing Architecture – AdvancedTCA – is the first specification for scaleable network architectures (carrier-grade systems), standardized among manufacturers and applications, to employ the cutting-edge switched-fabric technology. Alongside the system platform, the mechanical specification, power supply, cooling, system management and backplane topologies are all defined.

### Faster and more efficiently to market.

AdvancedTCA chassis and boards can be easily combined with one another, allowing you straight away to create the most diverse range of network configurations, flexibly, quickly and cost-effectively. The result? Your products reach the market faster, because you can concentrate completely on your real task: developing boards and software.

### Flexibility on one platform.

The modular approach and support of the latest data transfer protocols allows the development of convergent telecommunications systems. This means that you can use the same case and/or the same backplane with multiple modules for different applications such as blade servers, media gateways or Internet security on the same platform. With this feature, AdvancedTCA makes available a standard-based architecture for many different applications.

## THE STANDARD

- Effective capacity for data transfers of up to 2.5 Tb/s
- Performance of data cables > 3.125 Gb/s
- Heat loss up to 200 W per board
- 99.999 % system availability, equivalent to max. 5.3 minutes downtime per year
- Redundancy ensures highest failure safety
- Hot-swap capability gives uninterrupted operation
- Shelf management allows the administration and monitoring of system resources
- Perfect protection of boards with electronic coding (e-keying)
- Support for various protocols including Ethernet (PICMG 3.1), Infiniband (PICMG 3.2), Star Fabric (PICMG 3.3), PCI Express (PICMG 3.4) and Rapid I/O (PICMG 3.5) for fast interfaces

Complete systems from Schroff – there is no greater variety.

Complete solutions from the experts

# and makes it possible

The biggest choice of system: assembled and tested

- Impressively fast: available worldwide from stock
- Safety: UL certified, prepared for NEBS examination
- Competent project support by experts worldwide

#### Everything a system needs.

Schroff's AdvancedTCA systems make the development of new, forward-looking telecommunications installations with high data-processing rates as simple for you as possible. We offer everything on the basis of the AdvancedTCA specification that you have come to expect from a Schroff complete system: superb physical construction, optimal cooling, reliable power supplies, efficient data distribution and secure system management. Sometimes this is still not enough: our complete systems are, of course, also available in shock and vibration-proof versions with UL certification.

#### The full programme.

With Schroff you receive assembled and tested AdvancedTCA systems. You may choose from different height, cooling design and backplane topology options, two shelf management solutions and various numbers of slots. We offer a broad array of AdvancedTCA systems. Available worldwide.

#### Effortless integration.

We have decades of experience in the integration of mechanical, electronic and thermal components. If you wish we can also create a solution tailored to your individual requirements. This will ensure that the mechanical, electronic and thermal aspects are perfectly matched to suit your individual environment. You may rest assured that all components work together perfectly.

#### Developments with system.

We also offer small AdvancedTCA systems with a focus on development environments. In these compact 2 and 5 slot AdvancedTCA systems the boards are mounted horizontally. Hot-swap capable fan trays provide the necessary cooling. These systems have an AC power supply and thus are suitable for use in a laboratory and test environment.



#### WHY CHOOSE SCHROFF

- Conformity to PICMG 3.0 AdvancedTCA specification
- Cooling capacity up to 300 W per board
- Performance of data cables already 6.25 Gb/s
- Comprehensive worldwide project support by experts
- Easily downloadable test reports and firmware from the Internet
- Optimal system cooling with FLOTHERM simulations and verification of data in climate laboratory



High performance and availability in a small package

# MicroTCA – a flexible system

## High performance with a small form factor!

- Modular system concept with extremely high flexibility
- Future-proof platform for the development of new products
- Performance reserves for future processor generations



### Small, flexible, high performance.

In order to provide a standard platform right to the access/edge areas of telecommunications networks, the PICMG® MicroTCA R1.0 specification for small, flexible system solutions was released in June 2006. MicroTCA is suited to the requirements for systems and services with high availability. MicroTCA systems also use AdvancedMC modules, which are connected directly onto the backplane.

### On the advance in many markets.

MicroTCA systems are attractive for any situation in which an AdvancedTCA system would be overspecified. They are thus gaining popularity in industrial automation, image processing and medical and defence technology applications. Many versatile applications are possible using various system designs, from very small, simply equipped two-slot systems to systems with full redundancy and remote monitoring.

### Simply change over to the technology of the future.

Today you can take advantage of a very large range of different AdvancedMC modules and save on costly new product developments. MicroTCA is also flexible with regard to the operating system. Whether you are running Linux or Windows-based applications, you can migrate them onto MicroTCA systems. With new projects in particular, a move to MicroTCA will prove cost-effective.



## THE STANDARD

- Effective capacity for data transfer of up to 480 Gb/s (at 10 Gb/s per port)
- Data-cable performance > 10 Gb/s
- Heat loss up to 80 W per module
- 99.999 % system availability, i.e. max. 5.3 minutes down-time per year
- Redundancy ensures highest failure safety
- Hot-swap capability ensures uninterrupted operation
- Shelf and carrier management allow administration and monitoring of system resources
- Perfect board protection via electronic coding (e-keying)
- Support for all AdvancedMC protocols
- Standardized miniature boards

Schroff technology and know-how: always the first choice.

The right solution for every performance level

# m with a bright future

## Systems, components and the full range of accessories

- Highest performance in an extremely small form
- Comprehensive programme: the right solution for every requirement
- Competent consultancy worldwide



### The best advice to help you achieve your goals faster.

As pioneers and worldwide trendsetters in MicroTCA and AdvancedTCA technologies, we combine know-how and engineering capacity under one roof. For you this means comprehensive, competent advice, efficient implementation and fast delivery. Nowhere is the way to a complete system simpler.

### The driving force - from the start.

Our leading role in determining the mechanical aspects of the MicroTCA specification and our decades of experience in building custom solutions for our customers for the widest variety of applications ensure that Schroff MicroTCA systems are efficient from the word go.

### Using our knowledge. Securing our lead.

Our custom-designed seminars on AdvancedTCA, MicroTCA and AdvancedMC allow us to provide an uncomplicated transfer of knowledge. Come to one of the events held at the Schroff Training Center in Straubenhardt or contact our experts to arrange a visit to your premises. And the highlight: we can offer you a fast, modern knowledge transfer using new media such as webinars, webcasts and white papers, with all the convenience of the Internet.

[www.a-tca.com](http://www.a-tca.com)

## WHY CHOOSE SCHROFF

- Conformity to PICMG MicroTCA.0 R1.0 specification
- Wide product spectrum from subracks through to finished systems and custom modifications
- Various versions (horizontal/vertical, with/without management, with/without redundancy, development systems)
- optimized cooling designs (improved air flow through FLOTHERM simulation and wind-tunnel tests by Schroff)
- Backplanes and electronic components: simulation, development, production and testing - all under a single roof.

Multiple functions, universally applicable

# AdvancedMC modules – co

## Double application: modules for AdvancedTCA and MicroTCA

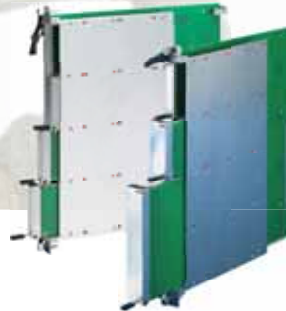
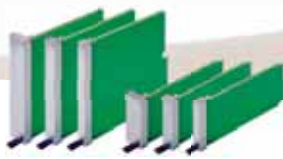
- Dedicated boards for the electronics market
- Added value: EMC shielding included
- Simple configuration using front panels with screwless interlocking

### Onto the MicroTCA backplane direct.

With their six form factors, indispensable hot-swap capability, support for very fast serial protocols and intelligent module management, AdvancedMC modules are also designed for use with MicroTCA. On this likewise modular platform with its very small dimensions, AdvancedMC modules are plugged directly into the MicroTCA system. Carriers, such as for AdvancedTCA, are not required.

### In carriers for AdvancedTCA.

The AdvancedMC specification is an important element of the AdvancedTCA platform. AdvancedMC modules are the smallest swappable unit in an AdvancedTCA system. Mezzanine modules are fitted into an AdvancedTCA system via suitable adaptors, AdvancedMC carriers, and therefore extend the function of an AdvancedTCA carrier board.



## THE STANDARD

- Support for modern transfer protocols such as GBit and 10 GBit Ethernet, PCI-Express, Rapid I/O, Serial ATA/SAS and Advanced Switching
- Maximum heat loss 80 W/module
- Hot-swap capability (insertion and removal during operation)
- Integrated module management
- System platform for e.g. telecoms, audio-video broadcasting, transport and defense technologies

Modular parts from Schroff: the easiest way.



Standard products and modifications for your special product requirements

# Impact and capable



## Proven mechanics and an impressive design!

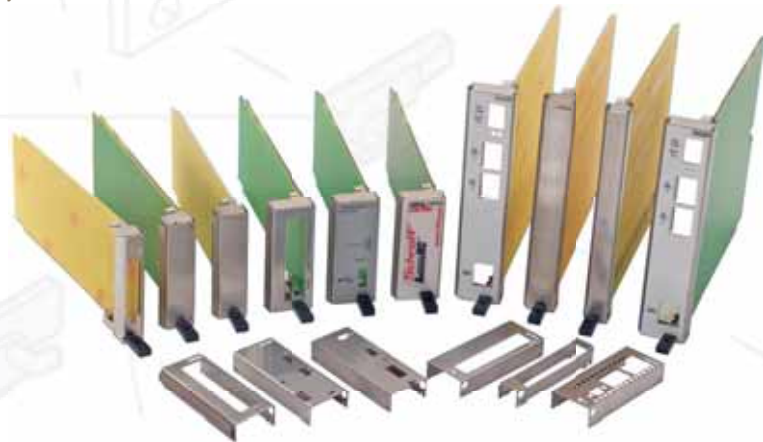
- Shock and vibration testing to MicroTCA.1 R0.6 (2 November 2007)
- Safety through thermal simulation and verification
- Individual services such as printing, cut-outs and assembly

### Fully developed and accurately matched.

As contributors to the PICMG AdvancedMC.0 specification we have brought years of experience in developing AdvancedTCA mechanics and translated the very high demands of the specification into products of high technical quality. Our AdvancedMC modules impress with their fully-developed components with excellent finish, high accuracy of matching and comprehensive accessories.

### Multiple options.

Choose the module that best suits your application from our vast product offering. Modifications such as cut-outs or silk-screening make the module into your custom solution. As an additional option, we can also assemble your boards.



## WHY CHOOSE SCHROFF

- Conformity to PICMG® AMC.0 RC1.1 and PICMG® AMC.0 R.2.0 RC 1.2 specifications
- Modules in two heights (single or double), three widths and suitably matched AdvancedMC carriers
- Patented EMC gasketing
- For other sizes and special features please ask us
- Custom modifications e.g. cut-outs, silk-screening, overlays, painting, assembly and kitting on request
- Includes light-pipe for standard LEDs
- Module interlocking without screws
- Filler solutions also with adjustable air throughput
- Microswitch



The future of communications platforms is modular

# Focussed on data traffic

AdvancedTCA + AdvancedMC + MicroTCA = Complete telecommunication solutions

**AdvancedTCA: High data volumes. High availability.**

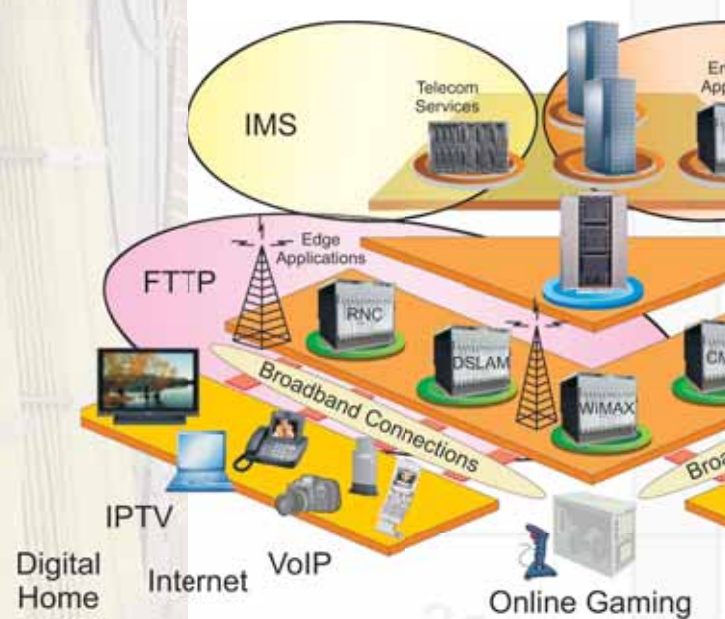
AdvancedTCA applications are to be found in the core areas of telecommunications networks - situations in which extremely high data volumes must be processed with almost 100 % availability. Leading equipment manufacturers and service providers worldwide are now opting for platforms based on the open AdvancedTCA specification. The processing of high data volumes calls for enormous computing power. The result is a high heat loss (specified in the standard as up to 200 W per board). We think ahead and offer our customers a high margin of safety, so our highly-developed cooling designs today achieve up to 300 W of cooling per board. This ensures that you are well positioned for the future.

**TYPICAL APPLICATIONS INCLUDE:**

- Carrier-grade applications
- Media gateways
- Image processing
- Medical technology
- Video on demand
- Security and military applications
- Internet security
- 3G, UMTS, WIMAX
- Scientific research projects, e.g. particle accelerators

**MicroTCA in telecoms applications: High computing power. Low system costs.**

For the telecommunications periphery, high-power AdvancedTCA computers are "too powerful" and too overspecified, since data traffic in these areas of the network is lower. Even here, however, very high computing power is required, for example, to encrypt data and build firewalls. In telecommunications, MicroTCA is mainly deployed in the access areas, in base stations and the internal telecommunications networks of medium-sized and large companies.



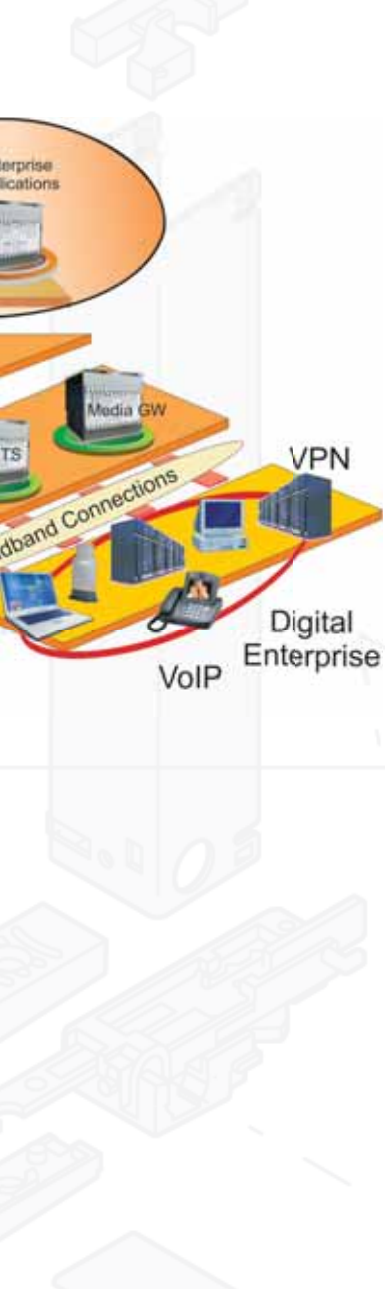
**TYPICAL APPLICATIONS INCLUDE:**

- Base stations
- VoIP gateways
- WiMAX solutions
- IP telephony
- IP TV
- Media servers

## A new standard gathers momentum



**AdvancedMC + MicroTCA = A revolution in many markets**



### Attractive for many applications.

High speed and high availability, scalable infrastructure, a compact form factor with AdvancedMC modules, system management including remote diagnosis and robust construction make MicroTCA an attractive option for many areas of application beyond telecommunications.



- Medical technology
- Security technology
- Industrial automation
- Defence technology
- Transport applications
- Image processing

# μTCA™

### The MicroTCA Industry Cube.

A possible configuration for a MicroTCA-based industrial system comprises a CPU card, hard disk module, graphics card and two additional slots for application-specific plug-in boards. Here, data-transfer cards would be GBit Ethernet, PCI -Express and Serial ATA. The AC power input is situated on the rear of the unit. The 12 V supply required for the AdvancedMC module is provided via an open-frame power-supply unit in the rear section of the case. A powerful fan below the board cage provides the necessary cooling, drawing cool air upwards through the cage. What is surprising here is that the entire application fits into a case just 155 mm wide, 135 mm high and 250 mm deep.



Why our systems make a difference

# Our commitment to quality

## Everything from one source

- Development of all components and system integration
- Short development times and fast manufacturing
- Security through tests and certification



### The measure of all things.

Hidden in each of our solutions is the knowledge gathered in over 40 years of development, manufacturing and integration of mechanical and electronic components into functioning systems. We continue to set standards by it worldwide - and to give new impulses. Why can we do this? Because we have made the needs and future of our customers into the measure of all things.

### Responsibility for the future.

Our know-how as electronic packaging experts influences international standards. We have been actively involved since 1978 in the IEC standard "Mechanical construction for electronic devices". We have been a member of VITA (VME Industrial Trade Association) for over 20 years and active in the PICMG for more than 10 years. As an international company with globally active customers we feel jointly responsible for developments in standardization since we deploy the latest technologies, realizing them in standard product platforms.

### Always one step ahead.

Short development times and rapid market introduction without costly development and testing processes - this has been the goal of our worldwide teams of experts as they participated actively in developing the PICMG AdvancedTCA specification. The result: a leading role in defining the mechanical section, and delivery of the first development systems even before adoption of the AdvancedTCA specification (PICMG 3.0, rev. 2.0) in December 2002.



### All components working optimally together.

Members of the AdvancedTCA/MicroTCA Working Group meet regularly for so-called Interoperability Workshops (AIW/MIW) to test the interaction of their products, such as boards, software, chassis and shelf management systems and to gain new knowledge that can be used to refine the standard. Schroff hosted one of these workshops in the USA and the first European workshop took place at Schroff's premises in Germany.

### System Integration.

What our customers want is electronics packaging as a complete solution. We understand system integration as building the basic elements of electronics packaging, such as cabling, climate control and power supply, into one cabinet or case. And this may be at the most varied levels of integration. Users thus obtain a plug-and-play product for their 19" systems from a single supplier, avoid interface problems and profit from being able to concentrate more intensely on their own core competencies.

## INTEGRATED SYSTEMS FROM SCHROFF

- Chassis
- Backplane
- Shelf management
- Thermal management
- Voltage supply
- Fully wired, tested and certified

Electronics Packaging from Schroff – simply one step ahead.

Why our system chassis make a difference

# is driven by passion

## Globally, standardized mechanical components

- Flexible and economical: modular building blocks
- Proven over the years: high quality, robust construction
- Safe: solid construction elements for a demanding electronics environment

### Market-leading product programme.

The first AdvancedTCA systems began service in early 2004. Today Schroff offers the 4th generation of AdvancedTCA systems in various versions, along with all accessories such as front panels, Advanced MC carriers, Advanced MC modules, filler panels, shelf managers and backplanes.

It is no coincidence that we now have a comprehensive and highly-developed mechanical parts programme for AdvancedTCA and MicroTCA. All FRUs (Field Replaceable Units) for standard systems are available from stock. Telecoms equipment manufacturers worldwide count among our customers.

### Standardized components.

Our products are based on standardized components. Within modular building blocks they allow highly economical solutions - that nevertheless make full demands for the security of the overall system. Our products are further distinguished by durability owing to high quality, high failure safety and low weight.

## WHY CHOOSE SCHROFF

- Global availability of a broad product offering - from stock, naturally
- Wide range of accessories
- Project support worldwide
- Complete service worldwide
- Flexibility, to our customers' advantage



Why our backplanes make a difference

# Brilliant communicators

## Backplanes: Functionality with efficiency

- Experience and competence in development and manufacturing
- In-house simulation and testing
- Custom modifications

### The core of data transmission.

The backplane is the core of data transmission in the system. The performance of the system overall is only as good and as "fast" as the beat of its "pulse". Serial, packet-orientated transfer protocols and point-to-point connections allow exceptionally high transfer rates of up to several terabits per second within the system.

### Efficient and future-proof.

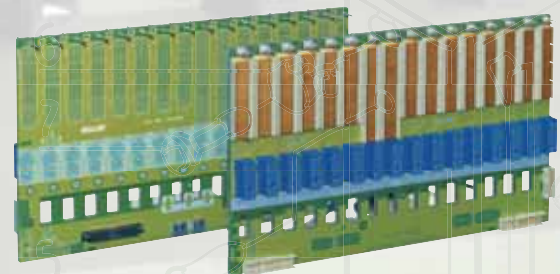
Schroff backplanes have proved their quality for decades - in many types of applications. Since demand on backplanes are growing more and more complex, our engineers - aided by modern simulations technology - are continually researching innovations in backplane technology. Our backplanes thus have, for example, fewer layers than comparable products and are already designed for transfer rates of up to 10 Gbit/s.

### AdvancedTCA – your individual solution.

The basic AdvancedTCA specification defines various backplane topologies and the physical characteristics of the conductors. The forming of the connections and thus performance and cost vary according to the backplane topology selected (Dual Star, Dual Dual Star or Full Mesh). Schroff supports these current AdvancedTCA topologies of up to 10 Gbit/s with 1, 2 or 4 ports between the slots according to the design. This lets you remain flexible; you pay only for the performance that your application requires.

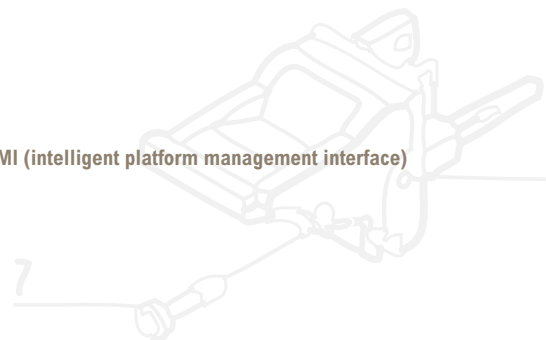
### MicroTCA - high-performance specialists.

Independent of protocol and with transfer rates of up to 10 Gbit/s per port, our MicroTCA backplanes are future-proof. The complex star topology, involving only a space of some 1.5 U on the board, calls for excellent know-how in backplane design in order to accommodate the large number of conductors on the smallest possible number of layers without detriment to performance. Precisely this is why Schroff MicroTCA backplanes are among the best on the market.



## WHY CHOOSE SCHROFF

- Conformity with PICMG 3.0 AdvancedTCA or PICMG MicroTCA.0 R1.0 basic specifications
- Data transfer of up to 10 Gbit/s - thus future-proof
- Wide product spectrum supports star, network and ring topologies plus bussed and radial IPMI (intelligent platform management interface)
- Development design and the latest simulation in-house
- Customization, manufacturing and assembly service



Innovations from Schroff – performance that inspires.

## Why our shelf management solutions make a difference

# Intelligent sentinels

### Shelf management with brains

- E-keying to protect boards and system
- Redundancy to maximize security
- Radial and bussed IPMI

#### AdvancedTCA: Everything under control.

The task of AdvancedTCA shelf management is known as "low-level hardware management". This monitors the basic functioning of the components on the chassis, ensures by means of electronic coding (e-keying) that only those AdvancedTCA boards may communicate with one another that have mutually compatible interfaces, monitors power distribution and may intervene appropriately in the event of problems. A further important function for shelf management is control of the fans in the chassis. Here the aim is to optimize the cooling of the components while minimizing the noise level generated by the fans. To ensure high availability, AdvancedTCA systems can be redundantly equipped with two shelf managers.

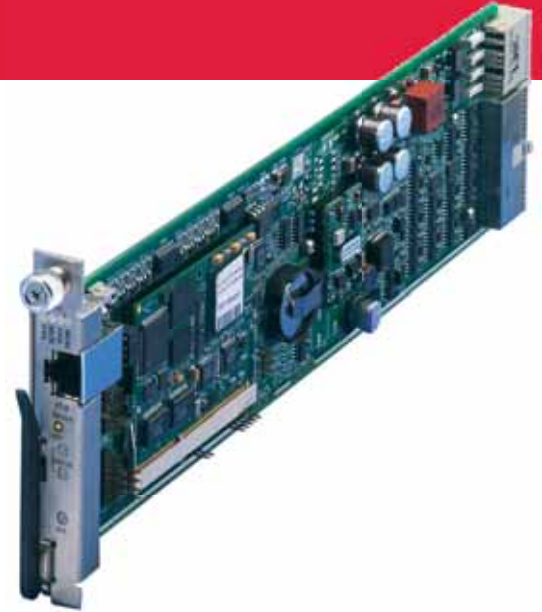
#### Bussed or radial: your choice.

Schroff shelf management is based on Pigeon Point Systems technology, well-known around the world. This technology supports both bussed and radial IPMI (intelligent platform management interface). With radial IPMI the shelf manager is separately linked via a point-to-point connection with each AdvancedTCA board, whereas in bussed IPMI all AdvancedTCA boards are connected to a common bus. Our product specialists can help you decide which version is better suited to your needs.

#### MicroTCA management structure.

In MicroTCA, systems management is divided among various components: the MicroTCA carrier hub (MCH), the power module (PM) and the cooling unit (CU). The central point is the MCH. This contains the logical carrier manager and in some versions also the shelf manager. Additionally, the MCH takes on the hub function in the system. The PM is the power supply unit in the MicroTCA chassis. It supplies power to each AdvancedMC module via its own separate connection controlled by the MCH. The CU is the fan unit; the rotational speed of the fan is controlled by the shelf manager.

Not only have Schroff MicroTCA systems with cooling units performed favorably in tests with all MCHs available on the market; they also serve as a reference design for the writing of MCH firmware by leading MCH manufacturers. In certain cost-sensitive industrial applications, however, it is possible to do without MCH altogether.



## WHY CHOOSE SCHROFF

- Global project support
- Supports various topologies: radial and bussed IPMI
- Shelf management is based on worldwide-established Pigeon Point Systems technology



Why our air-cooled systems make a difference

# Cooling capacities

## Performance far above the norm

- Cooling capacity of 300 W per board in complete AdvancedTCA systems
- Push or pull air cooling depending on application
- Optional air/water cooling

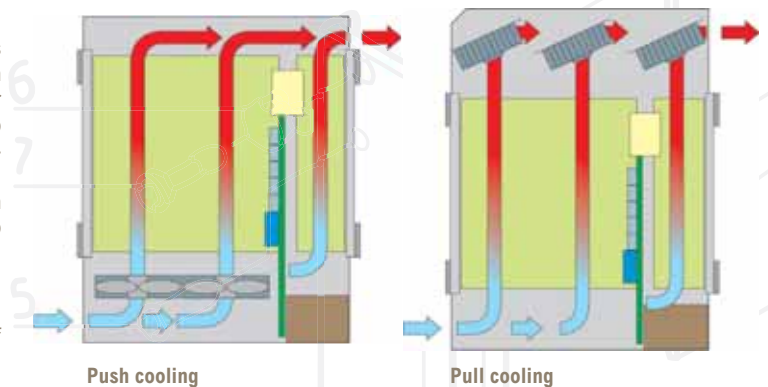


### 300 W per board: performance far above the norm.

Our systems are designed for a wide range of operating environments including enterprise applications. These applications often require high performance boards - pushing the slot requirements to 300 W - far beyond the ATCA specification. Schroff solutions can support up to 300 W per board (assuming a temperature rise of not more than 10 K) - under a broad range of operating conditions. Two distinct air-cooling methods exist, known as push cooling and pull cooling, each with different advantages, and our systems are available with either type - so always ensuring the most suitable cooling system for your application.

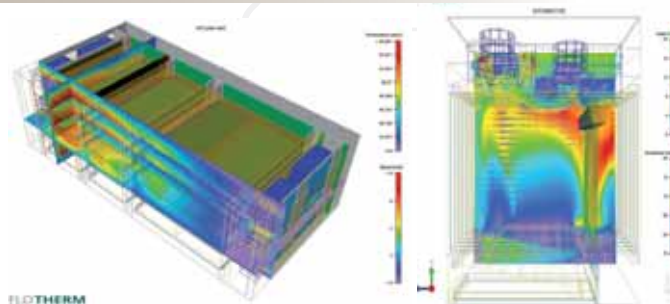
### Competence in the climate-control laboratory

We have decades of experience in the developing and cooling of complete systems. Whatever requirements you have to fulfill, we will provide you with the requisite cooling concept. Experienced air-conditioning specialists will support you from the start with comprehensive know-how and the latest technology. We create simulations for a cooling design optimized specially for your chosen physical structure and the planned heat loss from the installed components.



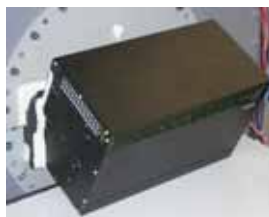
## Thermal simulation

We use FLOWTHERM simulation software to analyze cooling concepts at the outset. This allows us to spot any heat pockets or problem areas at the design stage.



## Testing in the laboratory

In our testing laboratories we perform professional examinations of cooling performance and noise levels and establish precise air volume flows and resistance curves. We check and verify the data gained from the simulation and thus hone our design by an iterative process.





## Why our liquid-cooled systems make a difference



### Technology for the most demanding environments

- Fully-designed complete cabinet solution with integrated cooling concept
- Remote monitoring via Ethernet Gateway
- Hybrid cooling (air/water) for boards in MicroTCA systems

#### Air and water: impressively cool.

For special applications in which pure air cooling is no longer sufficient, water cooling may also be used. This combination of cooling via fans and additional heat removal with water is known as hybrid cooling. It has the advantage that the hot processors (responsible for some 65 % of the heat produced) can be cooled by water, whose specific heat capacity is 4000 times greater than that of air by volume. All remaining components may be fan-cooled, the latter running at substantially slower speeds, resulting in lower air speeds and volumes.

#### Perfectly matched to each other.

Where two or three AdvancedTCA systems are built into a cabinet, air cooling reaches its limit. This is where our Varistar LHX 20 cabinet platform scores. With its integrated air/water heat exchanger, it can safely and efficiently remove up to 20 kW of heat per cabinet without warming the ambient air. Cabinet dimensions match exactly the AdvancedTCA installation dimensions and the air guides. The performance data is evaluated by the AdvancedTCA shelf manager. Varistar LHX 20 gives you a fully-elaborated total solution from a single source, one in which all components work together perfectly.

### WHY CHOOSE SCHROFF

- System cooling optimized by air measurements and heat simulations in a climate laboratory
- Comprehensive analyses eliminate possible problems at a preliminary stage
- Competent advice and planning increase the efficiency and economy of your climate-control solution
- Air cooling: Push and pull types
- Combined air/water (hybrid) cooling solution for critical high-power components
- Redundancy of cooling concept ensures maximum availability
- Conforms to NEBS (Network Equipment Building Standard) and ETSI (European Telecom Standard Institute) specification

Overview ..... 2

- AdvancedTCA ..... 4
- MicroTCA ..... 6
- AdvancedMC ..... 8
- Applications ..... 10
- Systems ..... 12
- Chassis ..... 13
- Backplanes ..... 14
- Shelf manager ..... 15
- Cooling designs ..... 16

AdvancedTCA ..... 18

AdvancedMC carriers ..... 42

MicroTCA ..... 52

AdvancedMC modules ..... 68

VARISTAR LHX 20 with air/water-heat exchanger... 74

Internet [www.a-tca.com](http://www.a-tca.com) .. 80

ServicePLUS ..... 82

Standards

- AdvancedTCA ..... 84
- MicroTCA ..... 86



12707010

All AdvancedTCA systems and components are developed and produced by Schroff. Everything from a single source means the perfect interaction of all components.

Our development team creates individual solutions and can respond very quickly to new requests.

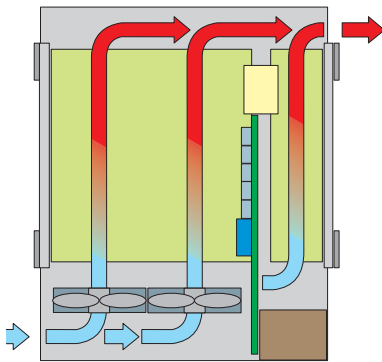
The compact design of AdvancedTCA systems and the immense performance of the AdvancedTCA and AdvancedMC modules place high demands on the cooling systems.

Cooling systems have a redundant design to ensure uninterrupted operation even in the case of a fan failure. The fans in the systems are more than adequate such that the 200 W heat loss per board can be safely dissipated in conformance with the AdvancedTCA Specification.

The 14 and 16 slot systems are designed for heat dissipation of up to 300 W per board without modification. Customers may choose between push and pull cooling to meet their requirements.

Schroff can supply fully-developed products in a wide variety of versions:

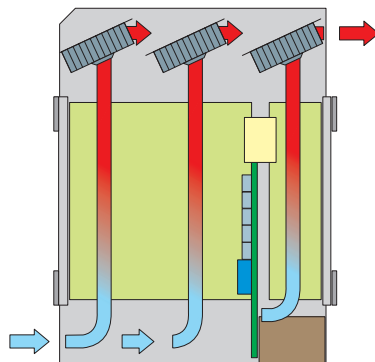
- Dimensions from 2 to 13 U
- Assembly of 2 to 16 slots
- Cooling designs (push, pull cooling)
- Backplane topologies (Dual star, Full Mesh)
- Shelf manager based on Pigeon Point technology, optionally for shelf manager with Intel NetStructure<sup>®</sup> MPCMM0002 (chassis management module)



12706053

### Push cooling

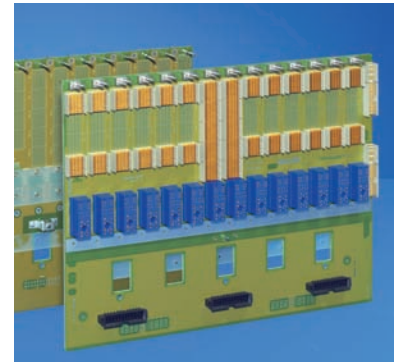
The fan is situated at the air inlet and pushes air through the system.



12706055

### Pull cooling

The fan is situated at the air outlet and sucks air through the system.



12606007

### Backplane

Backplanes with Full Mesh and Dual Star topology are available from stock, Replicated Mesh and Dual Dual Star, as well as customized topologies are available on request. The backplanes are designed for transmission rates of up to 10 GBit/s. To-date they already conform to the speed requirements of the next-but-one AdvancedTCA generation.

## Systems and components available world-wide

- Very large product range with regard to dimensions, number of slots, cooling designs, backplane topologies and shelf managers; all completely assembled and tested
- NEBS prepared, UL recognized
- For assembly into ETSI, 19" or 23" cabinets
- Cooling of up to 300 W per board



Overview . . . .18

### Systems

- 13 U, 16 slot, 96 HP . . . . . 20
- 13 U, 14 slot . . . . . 21
- 12 U, 14 slot . . . . . 22
- 13 U, 14 slot, without rear I/O . . . . . 23
- 6 U, 5 slot, with rear I/O . . . . . 24
- 5 U, 6 slot, Zephyr shelf . . . . . 25
- 5 U, 6 slot, Zephyr Enterprise Shelf . . . . . 26
- 5 U, 5 slot, AC version . . . . . 27
- 5 U, 5 slot, DC version . . . . . 28
- 3 U, 2 slot, AC version . . . . . 29
- 2 U, 2 slot, DC version . . . . . 30

### Accessories

- Shelf manager . . . . . 31
- Backplanes . . . . . 32
- Front panel kit . . . . . 33
- Front panels . . . . . 34
- Front panel with integrated Side Two Cover . . . . . 34
- Handles . . . . . 36
- Front panels/filler panels . . . . . 37

### AdvancedMC carrier . . . . . 42

### Field replaceable units (FRUs)

- Power entry modules . . . . . 38
- Fan trays . . . . . 39
- Air filter . . . . . 40
- Shelf alarm panel . . . . . 41
- Shelf alarm display . . . . . 41
- Chassis data module . . . . . 41

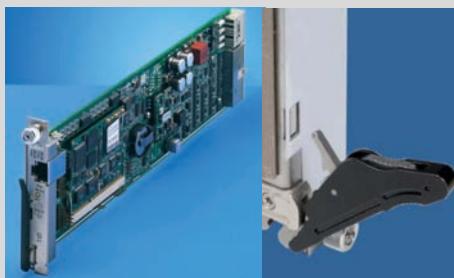


### AdvancedTCA systems

- 12 and 13 U; 14 and 16 slot
- Backplane with Dual Star or Full Mesh topology, bused or radial IPMB
- Push or pull cooling
- Shelf manager based on Pigeon Point technology



- 2 ... 6 U; 2 ... 6 slots
- Backplane with Dual Star, Triple Replicated Mesh topology or node/node configuration
- Push cooling (heat dissipation from right to left)
- Shelf manager based on Pigeon Point technology



### AdvancedTCA accessories

- Shelf manager based on Pigeon Point technology
- AdvancedMC carriers
- Front panels and handles
- Backplanes



[www.schroff.biz/serviceplus/](http://www.schroff.biz/serviceplus/)

### ServicePLUS (more details see page 82)

- configuration: Simple. Fast. To the ideal product.
- assembly: Assembled by professionals. Double benefit!
- modification: Small changes. Large impact.
- solution: Simple. Everything. From one source.
- support: Support. Solution. Availability.
- academy: Knowledge. Sharing. Partnerships.
- lifecycle: Bespoke service. For the entire life of the product.

## System, 13 U, 16 slot, 96 HP



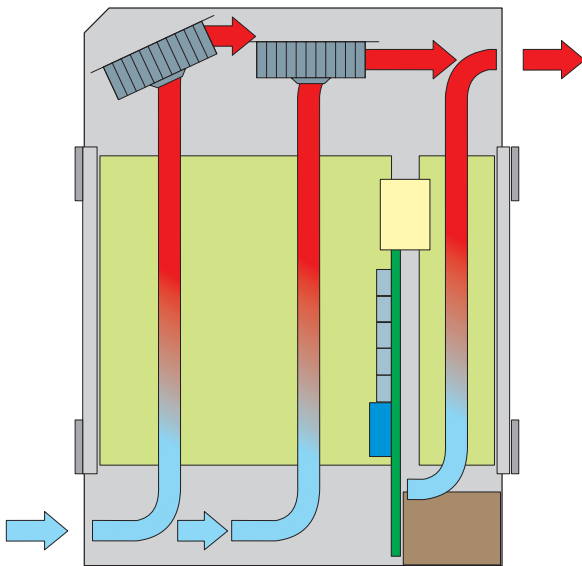
12705004

- In accordance with AdvancedTCA Standard PICMG 3.0 Rev. 2.0
- 16 slot backplane with Dual Star or Full Mesh topology
- Assembly of 16 boards, 8 U, 6 HP (front) and 16 rear I/O boards, 8 U, 6 HP (on the rear)
- Two redundant power entry modules (PEM) for supply voltage  $-48 V_{DC}/-60 V_{DC}$ , plugged in on the rear
- Top fan shelf with three redundant hot-swap fan trays inserted at rear, for cooling of up to 300 W per board (see FRUs)
- Provisions for two shelf managers with Pigeon Point ShMM 500 for bused or radial IPMB topology
- Shelf alarm panel (SAP)
- Shelf alarm display (SAD)



**Delivery comprises** (completely assembled, wired and tested)

Item	Qty	Description
1	1	Shielded 19" subrack, St, 13 U, 96 HP, powder coated, black, RAL 9005
2	16	Front slot; guide rails for vertical boards (8 U, 280 mm deep)
3	16	Rear slot; guide rails for vertical boards (8 U, 70 mm deep)
4	1	Backplane, 16 slot
5	2	Redundant $-48 V_{DC}/-60 V_{DC}$ power entry module (PEM), plugged in on the rear, with 4 pairs of lines each per input (8 fuses, 30 A)
6	1	Fan unit at top; 3 redundant fan trays with 390 m <sup>3</sup> /h (230 cfm) each, with 2 radial fans each to cool the front and rear I/O boards
7	1	Filter mat, removable from front
8	1	Shelf alarm panel (SAP)
9	1	Shelf alarm display (SAD)
10	1	Cable ducting at front and rear of system
11	2	Mounting bracket, for assembly in ETSI racks



12706054

Top fan shelf, pull cooling



12705007

Shelf manager

### Order Information

Height U	Width HP	Depth mm	AdvancedTCA system, black Type	Order no.
13	96	383	Dual Star, bused IPMB	<b>11592-500</b>
13	96	383	Dual Star, radial IPMB	<b>11592-501</b>
13	96	383	Full Mesh, bused IPMB	<b>11592-502</b>
13	96	383	Full Mesh, radial IPMB	<b>11592-503</b>
<b>Shelf manager (bused) 1 piece</b>				<b>21593-375</b>
<b>Shelf manager (radial) 1 piece</b>				<b>21593-376</b>
<b>Air filter for 16 slot AdvancedTCA system 1 piece</b>				<b>21594-144</b>
<b>Fuse 30 A/80 V for power entry module, PU 10 pieces</b>				<b>21191-207</b>
<b>Mounting bracket 13 U, RAL 9005, from ETSI to 23", PU 1 kit</b>				<b>21596-327</b>

- User manual: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)
- Front panels, air baffles see page 37
- Replacement parts (FRUs) see from page 38



ServicePLUS see page 82

## System 13 U, 14 slot, 84 HP



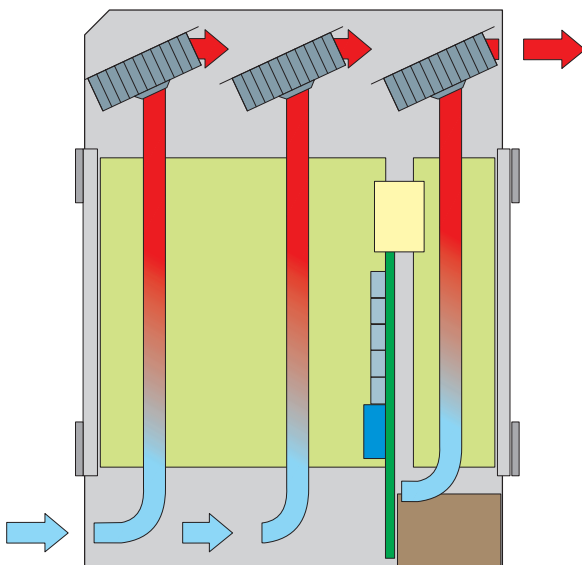
- In accordance with AdvancedTCA Standard PICMG 3.0 Rev. 2.0
- 14 slot backplane with Dual Star or Full Mesh topology
- Assembly of 14 boards, 8 U, 6 HP (front) and 14 rear I/O boards, 8 U, 6 HP (on the rear)
- Two redundant power entry modules (PEM) for supply voltage  $-48 V_{DC}/-60 V_{DC}$ , plugged in on the rear
- Top fan shelf with three redundant hot-swap fan trays inserted at rear, for cooling of up to 300 W per board (see FRUs)
- Provisions for two shelf managers with Pigeon Point ShMM 500 for bused or radial IPMB topology
- Shelf alarm panel (SAP)
- Shelf alarm display (SAD)



# NEW

**Delivery comprises** (completely assembled, wired and tested)

Item	Qty	Description
1	1	Shielded 19" subrack, St, 13 U, 84 HP, powder coated, black, RAL 9005
2	14	Front slot; guide rails for vertical boards (8 U, 280 mm deep)
3	14	Rear slot; guide rails for vertical boards (8 U, 70 mm deep)
4	1	Backplane, 14 slot
5	2	Redundant $-48 V_{DC}/-60 V_{DC}$ power entry module (PEM), plugged in on the rear, with 4 pairs of lines each per input (8 fuses, 30 A)
6	1	Fan unit at top; 3 redundant fan trays with 300 m <sup>3</sup> /h (175 cfm) each, with 3 radial fans each to cool the front and rear I/O boards
7	1	Filter mat, removable from front
8	1	Shelf alarm panel (SAP)
9	1	Shelf alarm display (SAD)
10	1	Cable ducting at front and at rear of system
11	2	Mounting bracket, for assembly in 19" cabinets



Top fan shelf, pull cooling



Shelf manager

### Order Information

Height U	Width HP	Depth mm	AdvancedTCA system, black Type	Order no.
13	84	383	Dual Star, bused IPMB	<b>11596-100</b>
13	84	383	Dual Star, radial IPMB	<b>11596-101</b>
13	84	383	Full Mesh, bused IPMB	<b>11596-102</b>
13	84	383	Full Mesh, radial IPMB	<b>11596-103</b>
<b>Shelf manager (bused) 1 piece</b>				<b>21593-375</b>
<b>Shelf manager (radial) 1 piece</b>				<b>21593-376</b>
<b>Air filter for 14 slot AdvancedTCA system 1 piece</b>				<b>21596-138</b>
<b>Fuse 30 A/80 V for power entry module, PU 10 pieces</b>				<b>21191-207</b>
<b>Mounting bracket 13 U, RAL 9005, from 19" to ETSI, PU 1 kit</b>				<b>21596-277</b>
<b>Mounting bracket 13 U, RAL 9005, from 19" to 23", PU 1 kit</b>				<b>21596-278</b>

- User manual: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)
- Front panels, air baffles see page 37
- Replacement parts (FRUs) see from page 38

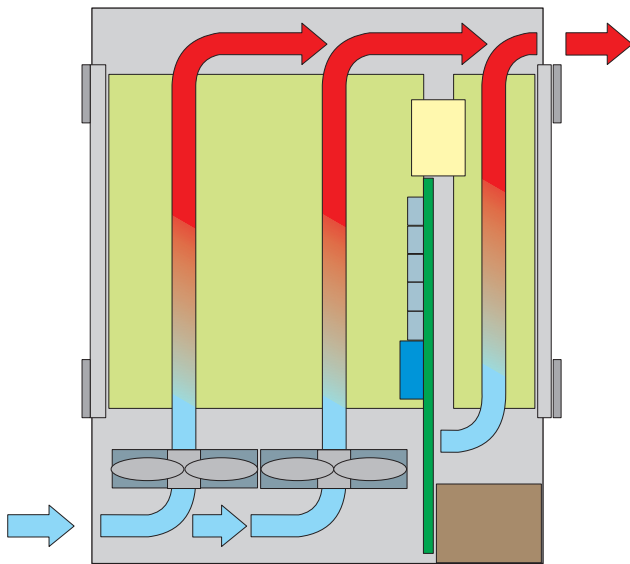


ServicePLUS see page 82

## System 12 U, 14 slot



12705005



12706053

Bottom fan shelf, push cooling



12705007

Shelf manager

- In accordance with AdvancedTCA Standard PICMG 3.0 Rev. 2.0
- 14 slot backplane with Dual Star or Full Mesh topology
- Assembly of 14 boards, 8 U, 6 HP (front) and 14 rear I/O boards, 8 U, 6 HP (on the rear)
- Two redundant power entry modules (PEM) for supply voltage  $-48 V_{DC}/-60 V_{DC}$ , plugged in on the rear
- Bottom fan shelf with three redundant hot-swap fan trays, inserted from front, for cooling of up to 300 W per board (see FRUs)
- Provisions for two shelf managers with Pigeon Point ShMM 500 for bused or radial IPMB topology
- Shelf alarm panel (SAP)



# NEW

**Delivery comprises** (completely assembled, wired and tested)

Item	Qty	Description
1	1	Shielded 19" subrack, St, 12 U, 84 HP, powder coated, black, RAL 9005
2	14	Front slot; guide rails for vertical boards (8 U, 280 mm deep)
3	14	Rear slot; guide rails for vertical boards (8 U, 70 mm deep)
4	1	Backplane, 14 slot
5	2	Redundant $-48 V_{DC}/-60 V_{DC}$ power entry module (PEM), plugged in on the rear, with 4 pairs of lines each per input (8 fuses, 30 A)
6	1	Fan unit at bottom; 3 redundant fan trays with 330 m <sup>3</sup> /h (195 cfm) each, with 2 fans each to cool the front and rear I/O boards
7	1	Filter mat, removable from front
8	1	Shelf alarm panel (SAP)
9	1	Cable ducting at front and at rear of system
10	1	Cover for shelf manager slot (enclosed loose)
11	2	Mounting bracket, for assembly in 19" cabinets

### Order Information

Height U	Width HP	Depth mm	AdvancedTCA system, black Type	Order no.
12	84	383	Dual Star, bused IPMB	<b>11596-300</b>
12	84	383	Dual Star, radial IPMB	<b>11596-301</b>
12	84	383	Full Mesh, bused IPMB	<b>11596-302</b>
12	84	383	Full Mesh, radial IPMB	<b>11596-303</b>
<b>Shelf manager (bused) 1 piece</b>				<b>21593-375</b>
<b>Shelf manager (radial) 1 piece</b>				<b>21593-376</b>
<b>Air filter for 14 slot AdvancedTCA system 1 piece</b>				<b>21596-002</b>
<b>Fuse 30 A/80 V for power entry module, PU 10 pieces</b>				<b>21191-207</b>
<b>Adaptor 12 U RAL 9005, from 19" to ETSI, PU 2 pieces</b>				<b>21596-273</b>
<b>Adaptor 12 U RAL 9005, from 19" to 23", PU 2 pieces</b>				<b>21596-274</b>

### Note

- User manual: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)
- Front panels, air baffles see page 37
- Replacement parts (FRUs) see from page 38

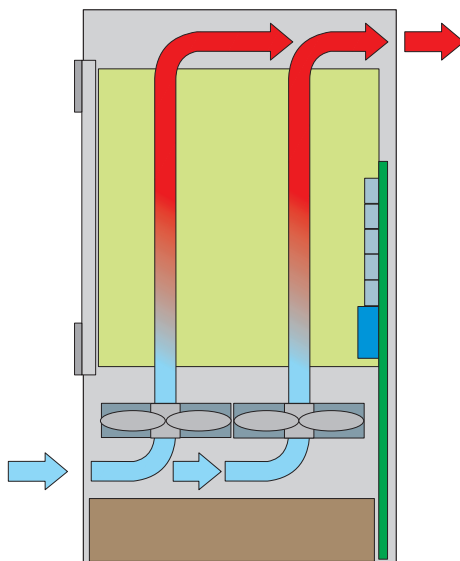


ServicePLUS see page 82

## System, 13 U, 14 slot, without rear I/O



12707006



12707050

Bottom fan shelf, push cooling



12705007

Shelf manager

- 14 slot backplane with Dual Star topology, bused IPMB
- Assembly of 14 boards, 8 U, 6 HP (front), **without** rear I/O board assembly space on the rear
- Two redundant front plug-in power entry modules (PEM), for supply voltage  $-48 V_{DC}/-60 V_{DC}$
- Bottom fan shelf with three redundant hot-swap fan trays inserted at front, for cooling of up to 300 W per board
- Provisions for two shelf managers with Pigeon Point ShMM 500 for bused IPMB topology
- Shelf alarm panel (SAP)

# NEW

### Delivery comprises (completely assembled, wired and tested)

Item	Qty	Description
1	1	Shielded 19" subrack, St, 13 U, 84 HP, powder coated, black, RAL 9005
2	14	Front slot; guide rails for vertical boards (8 U, 280 mm deep)
3	1	14 slot backplane, Dual Star, bused IPMB
4	2	Redundant $-48 V_{DC}/-60 V_{DC}$ power entry module (PEM), plugged in at front, with 1 pair of lines each per input (8 fuses, 30 A)
5	1	Fan unit at bottom; 3 redundant fan trays with $330 m^3/h$ (195 cfm) each, with 2 fans each to cool the front I/O boards
6	1	Filter mat, removable from front
7	1	Shelf alarm panel (SAP)
8	1	Cable channel at front of system
9	1	Cover for shelf manager slot (enclosed loose)
10	2	Mounting bracket, for assembly in 19" cabinets

### Order Information

Height U	Width HP	Depth mm	Order no.
13	84	320	<b>11596-040</b>
<b>Shelf manager (bused)</b> 1 piece			<b>21593-375</b>
<b>Air filter for 14 slot AdvancedTCA system</b> 1 piece			<b>21596-002</b>
<b>Fuse 30 A/80 V for power entry module, PU</b> 10 pieces			<b>21191-207</b>
<b>Adaptor 12 U RAL 9005, from 19" to ETSI, PU</b> 2 pieces			<b>21596-273</b>
<b>Adaptor 12 U RAL 9005, from 19" to 23", PU</b> 2 pieces			<b>21596-274</b>

### Note

- User manual: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)
- Front panels, air baffles see page 37
- Replacement parts (FRUs) see from page 38

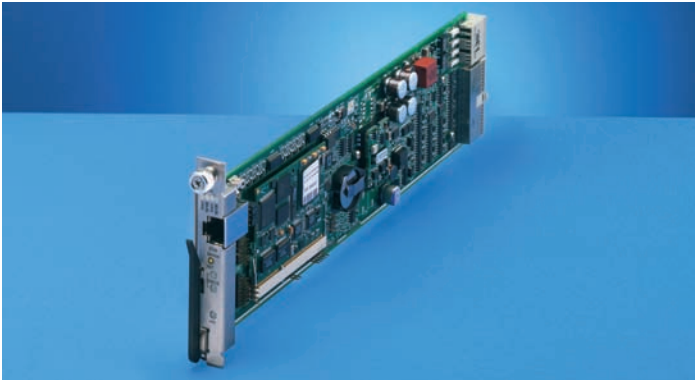


ServicePLUS see page 82

## System, 6 U, 5 slot, without rear I/O



12707007



12705007

Shelf manager



ServicePLUS see page 82

- 5 slot backplane with Dual Star topology, bused IPMB
- Assembly of 5 boards, 8 U, 6 HP (front), **without** rear I/O board assembly area on the rear
- Fan tray with two fans for cooling from right to left (push cooling); up to 200 W per board; fan monitoring with fan control module (FCM)
- Shelf manager
  - Provisions for 2 shelf managers with Pigeon Point ShMM 500
  - Operation also possible without shelf manager
  - Two serial interfaces (front) for connection to the shelf managers
- Two redundant front plug-in power entry modules (PEM), for -48 V<sub>DC</sub>/-60 V<sub>DC</sub> voltage supply

# NEW

### Delivery comprises (completely assembled, wired and tested)

Item	Qty	Description
1	1	Shielded 19" subrack, St, 6 U, 84 HP, powder coated, black, RAL 9005
2	5	Front slot; guide rails for horizontal boards (8 U, 280 mm deep)
3	1	5 slot backplane, Dual Star, bused IPMB
4	2	Redundant -48 V <sub>DC</sub> /-60 V <sub>DC</sub> power entry module (PEM), plugged in at front, with 1 pair of lines each per input (8 fuses, 30 A)
5	1	Fan tray; with 2 fans to cool the boards
6	1	Filter mat, removable from front
7	1	FCM for fan monitoring
8	2	Cover for shelf manager slot (enclosed loose)
9	2	Mounting bracket, for assembly in 19" cabinets

### Order Information

Height U	Width HP	Depth mm	Order no.
6	84	320	<b>11596-045</b>
Shelf manager (bused) 1 piece			<b>21593-375</b>
Air filter for 5 slot AdvancedTCA system PU 10 pieces			<b>21596-115</b>
Fuse 30 A/80 V for power entry module, PU 10 pieces			<b>21191-207</b>

### Note

- User manual: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)
- Front panels, air baffles see page 37
- Replacement parts (FRUs) see from page 38



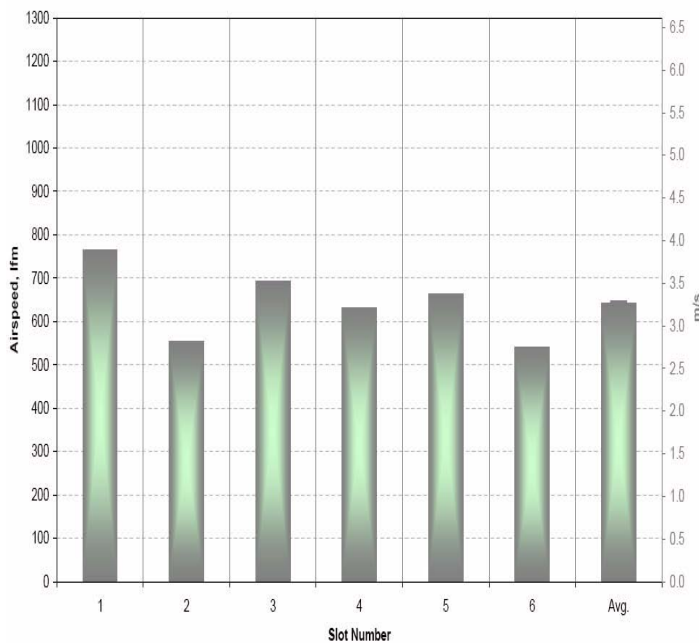
For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.



## System, 5 U, 6 slot, Zephyr Shelf



12706013



12706051



ServicePLUS see page 82

- In accordance with AdvancedTCA Standard PICMG 3.0 Rev. 2.0
- Distributed intelligent platform management interface (IPMI) using IPM enabled field replaceable units (FRUs)
- 6 slot backplane with Triple Replicated Mesh topology, bused IPMI
- Assembly of 6 boards, 8 U, 6 HP (front) and rear I/O boards (on the rear)
- Two hot-swap fan trays for cooling from right to left (push/pull cooling); up to 200 W per board; with IPMI
- Provisions for two shelf managers with Pigeon Point ShMM 500 and provision for one Shelf alarm panel
- Voltage supply  $-48 V_{DC}/-60 V_{DC}$ , two redundant power entry modules (PEM), inserted at rear; with IPMI

### Delivery comprises (completely assembled, wired and tested)

Item	Qty	Description
1	1	Shielded 19" subrack, St, 5 U, 84 HP, powder coated, black, RAL 9005
2	6	Front slot; guide rails for horizontal boards (8 U, 280 mm deep)
3	6	Rear slot (rear I/O); guide rails for horizontal boards (8 U, 80 mm deep)
4	1	6 slot backplane, Triple Replicated Mesh, bused IPMI with IPMC
5	2	Redundant $-48 V_{DC}/-60 V_{DC}$ power entry module (PEM), plugged in on the rear
6	2	Telescopic fan unit (with 6 fans each), accessible from front; with Intelligent Platform Management Controller (IPMC)
7	1	Intelligent Platform Management Interface (IPMI) monitored air filter

### Order Information

Height U	Width HP	Depth mm	Order no.
5	84	445	<b>ZR5ATC6TMDPEM2N</b>
<b>Shelf manager (bused)</b> 1 piece			<b>21593-375</b>
<b>Shelf alarm panel</b> 1 piece			<b>21596-077</b>
<b>Intelligent shelf alarm panel</b> 1 piece			<b>ISAP2</b>
<b>Fan tray FRU</b> 1 piece			<b>ZR5-FTM</b>
<b>Power entry module FRU</b> 1 piece			<b>ZR5-PEM</b>

### Note

- Other configurations available on request



For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.

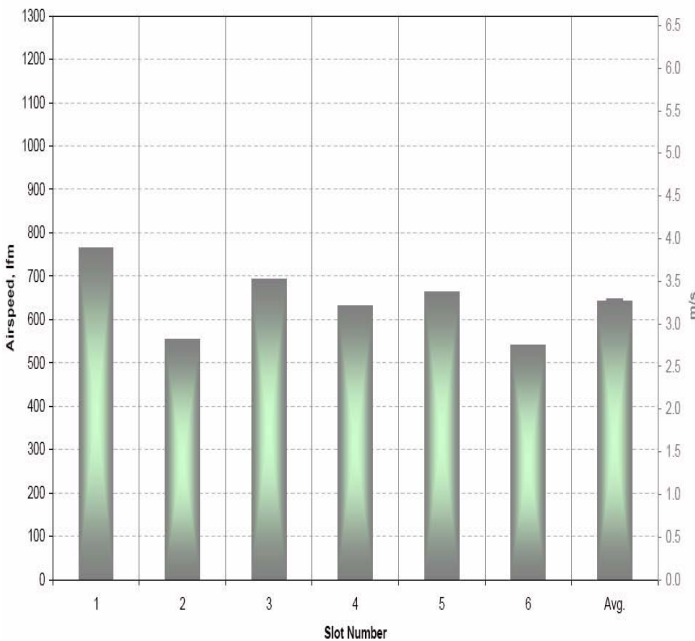
## System, 5 U, 6 slot, Zephyr Enterprise Shelf



12706013

- In accordance with AdvancedTCA standard PICMG 3.0 Rev. 2.0
- 6 slot backplane with Triple Replicated Mesh topology, bused IPMI
- Designed to accept 6 front boards, 8 U, 6 HP (at front) and rear I/O boards
- Two hot-swap fan units (with 6 fans per tray) for cooling of up to 200 W per board
- Provisions for 2 Shelf Managers with Pigeon Point ShMM 500 and provision for one Shelf alarm panel
- Voltage supply 40 V<sub>DC</sub> ... 72 V<sub>DC</sub>; two redundant Power Entry Modules (PEM) plugged at rear

# NEW



12706051

### Delivery comprises (completely assembled, wired and tested)

Item	Qty	Description
1	1	Shielded 19" subrack, St, 5 U, 84 HP, powder coated, black, RAL 9005
2	6	Front slot; guide rails for horizontal boards (8 U, 280 mm deep)
3	6	Rear slot (rear I/O); guide rails for horizontal boards (8 U, 80 mm deep)
4	1	6 slot backplane, Triple Replicated Mesh, bused IPMI
5	2	Redundant -48 V <sub>DC</sub> /-60 V <sub>DC</sub> power entry module (PEM), plugged in on the rear
6	2	Telescopic fan unit (with 6 fans each), accessible from front
7	1	Monitored air filter

### Order Information

Height	Width	Depth	Order no.
U	HP	mm	
5	84	497	<b>ZR5ATC6TMDE2</b>
Shelf manager (bused) 1 piece			<b>21593-375</b>
Cable RJ 45 CAT 5 D-SUB plug 9-pin, length 2 m, 1 piece			<b>23204-187</b>
Shelf alarm panel 1 piece			<b>21596-077</b>

### Note

- Other configurations available on request



For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.



ServicePLUS see page 82

## System, 5 U, 5 slot, AC version



12706019

- In accordance with AdvancedTCA Standard PICMG 3.0 Rev.2.0
- 5 slot backplane with Triple Replicated Mesh topology, bused IPMI
- Assembly of 5 boards, 8 U, 6 HP (front) and rear I/O boards (on the rear)
- Hot-swap fan tray for cooling from right to left (push cooling); up to 200 W per board
- Provisions for one shelf manager with Pigeon Point ShMM 500 and one shelf alarm panel (SAP)
- Voltage supply 1200 W, 110/230 V<sub>AC</sub>
- Easy access to boards by removable cover plate



12705007

Shelf manager

### Delivery comprises (completely assembled, wired and tested)

Item	Qty	Description
1	1	Shielded 19" subrack, St, 5 U, 84 HP, powder coated, black, RAL 9005
2	5	Front slot; guide rails for horizontal boards (8 U, 280 mm deep)
3	5	Rear slot; guide rails for horizontal boards (8 U, 70 mm deep)
4	1	5 slot backplane, Triple Replicated Mesh, bused IPMB
5	1	Power supply 1200 W, input voltage 110 ... 230 V <sub>AC</sub>
6	1	Fan unit with removeable fan tray, 490 m <sup>3</sup> /h (290 cfm)
7	1	Air filter
8	1	Equipment cable, USA connector, IEC 320 19 female connector, length 2.5 m



ServicePLUS see page 82

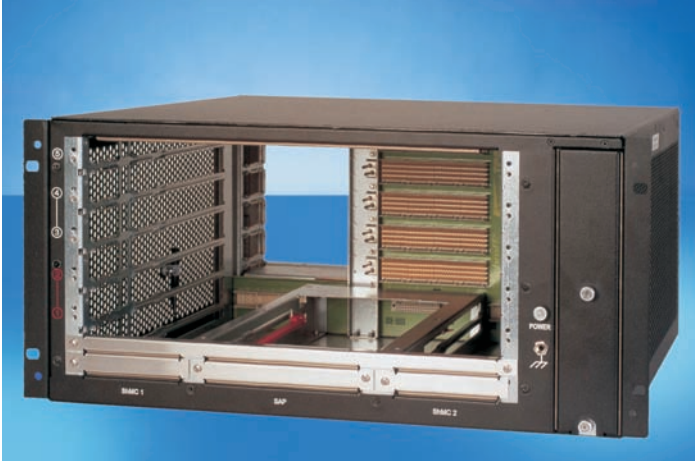
### Order Information

Height U	Width HP	Depth mm	Order no.
5	84	399.3	<b>11596-012</b>
<b>Shelf manager (bused)</b> 1 piece			<b>21593-375</b>
<b>Shelf alarm panel</b> 1 piece			<b>21596-077</b>
<b>Air filter</b> 1 piece			<b>21596-082</b>
<b>Equipment cable, SCHUKO/UTE</b>			
SCHUKO/UTE connector, IEC 320 C19 female connector, 2.5 m, 1 piece			<b>23204-196</b>
<b>Equipment cable, BS</b> British Standard connector, IEC 320 C19 female connector, 2.5 m, 1 piece			<b>23204-197</b>

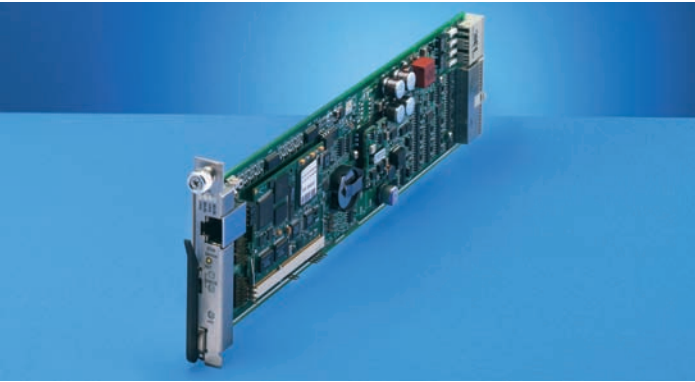
### Note

- Other configurations available on request
- Please order equipment cable with SCHUKO/UTE or British Standard connector and IEC-320 C19 female connector separately
- User manual: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)
- Front panels, air baffles see page 37
- Air filter see page 40

## System, 5 U, 5 slot, DC version



12706020



12705007

Shelf manager



ServicePLUS see page 82

- In accordance with AdvancedTCA Standard PICMG 3.0 Rev.2.0
- 5 slot backplane with Triple Replicated Mesh topology, bused IPMI
- Assembly of 5 boards, 8 U, 6 HP (front) and rear I/O boards (on the rear)
- Hot-swap fan tray with 490 m<sup>3</sup>/h (290 cfm) for cooling from right to left (push cooling); up to 200 W per board
- Provisions for two shelf managers with Pigeon Point ShMM 500 and one shelf alarm panel (SAP)
- Voltage supply -48 V<sub>DC</sub>/-60 V<sub>DC</sub>, two redundant power entry modules (PEM), with 25 A fuses
- Easy access to boards by removable cover plate

### Delivery comprises (completely assembled, wired and tested)

Item	Qty	Description
1	1	Shielded 19" subrack, St, 5 U, 84 HP, powder coated, black, RAL 9005
2	5	Front slot; for horizontal boards (8 U, 280 mm deep)
3	5	Rear slot (rear I/O); for horizontal boards (8 U, 80 mm deep)
4	1	Backplane, 5 slot, Triple Replicated Mesh, bused IPMB
5	2	Redundant -48 V <sub>DC</sub> /-60 V <sub>DC</sub> power entry module (PEM), with 25 A fuses
6	1	Fan unit, removeable
7	1	Air filter

### Order Information

Height U	Width HP	Depth mm	Order no.
5	84	411.3	<b>11596-010</b>
Shelf manager (bused) 1 piece			<b>21593-375</b>
Shelf alarm panel 1 piece			<b>21596-077</b>
Air filter 1 piece			<b>21596-082</b>

### Note

- Other configurations available on request
- User manual: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)
- Front panels, air baffles see page 37
- Air filter see page 40



For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.

### System, 3 U, 2 slot, AC version



12706018



12705007

Shelf manager



ServicePLUS see page 82

- In accordance with AdvancedTCA Standard PICMG 3.0 Rev.2.0
- Backplane 2 slot, node/node configuration
- Assembly of two boards, 8 U, 6 HP (front) and rear I/O boards (on the rear)
- Fan for cooling from right to left (push/pull cooling); up to 200 W per board
- Voltage supply AC
- Easy access to boards via removable cover plate

#### Delivery comprises (completely assembled, wired and tested)

Item	Qty	Description
1	1	Shielded 19" subrack, St, 3 U, 84 HP, powder coated, black, RAL 9005
2	2	Front slot; guide rails for horizontal boards (8 U, 280 mm deep)
3	2	Rear slot (rear I/O); guide rails for horizontal boards (8 U, 80 mm deep)
4	1	Backplane, 2 slot, node/node configuration
5	1	Power supply 800 W, input voltage 115 ... 230 V <sub>AC</sub>
6	2	Fan tray
7	1	Air filter, removeable

#### Order Information

Height U	Width HP	Depth mm	Order no.
3	84	383	<b>11596-007</b>
<b>Shelf manager (bused)</b> 1 piece			<b>21593-375</b>
<b>Shelf alarm panel</b> 1 piece			<b>21596-077</b>
<b>Air filter</b> 1 piece			<b>21596-037</b>
<b>Equipment cable SCHUKO/UTE</b> SCHUKO/UTE connector, IEC 320 C13 female connector, 2.5 m, 1 piece			<b>60103-131</b>
<b>Equipment cable, BS</b> British Standard connector, IEC 320 C13 female connector, 2.5 m, 1 piece			<b>60103-137</b>

#### Note

- Please order equipment cable with SCHUKO/UTE or British Standard connector and IEC 320 C13 female connector separately
- Front panels, air baffles see page 37
- User manual: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)



For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.

## System, 2 U, 2 slot, DC version



12706017



ServicePLUS see page 82

- In accordance with AdvancedTCA Standard PICMG 3.0 Rev.2.0
- Perfect configuration for the introduction to AdvancedTCA
- Backplane 2 slot, node/node configuration, all 15 fabric channels are directly connected
- Assembly of two boards, 8 U, 6 HP (front) and rear I/O boards (rear)
- Two hot-swap fan trays for cooling from right to left (push/pull cooling); up to 200 W per board and 15 W per RTM board
- Two power entry modules (PEM) -48 V<sub>DC</sub>
- Easy access to boards by removable cover plate

### Delivery comprises (completely assembled, wired and tested)

Item	Qty	Description
1	1	Shielded 19" subrack, St, 2 U, 84 HP, powder coated, black, RAL 9005
2	2	Front slot; guide rails for horizontal boards (8 U, 280 mm deep)
3	2	Rear slot (rear I/O); guide rails for horizontal boards (8 U, 80 mm deep)
4	1	Backplane, 2 slot, node/node configuration
5	2	Power entry module (PEM) -48 V <sub>DC</sub>
6	2	Fan tray
7	1	Air filter

### Order Information

Height U	Width HP	Depth mm	Order no.
2	84	469	<b>11596-004</b>
Air filter 1 piece			<b>21596-028</b>

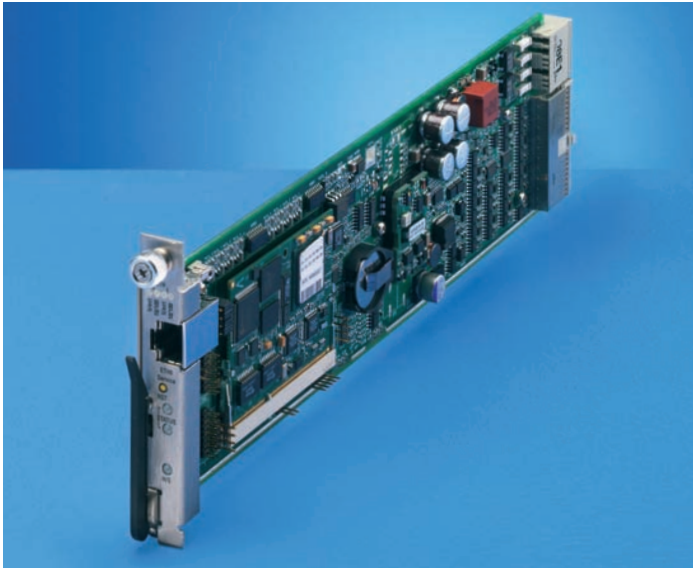
### Note

- Front panels, air baffles see page 37
- Air filter see page 40
- User manual: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)



For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.

## Shelf manager



12705007

- Based on Pigeon Point Shelf Management technology ShMM 500
- Prepared for use with up to two shelf managers per system
- Inclusive of stainless steel front panel and AdvancedTCA handle (black)

### Order Information

Height U	Width mm	Depth mm	Description	Qty/PU	Order no.
2	20	280	Shelf manager, bused version	1	<b>21593-375</b>
2	20	280	Shelf manager, radial version	1	<b>21593-376</b>
<b>Cable</b> RJ 45 CAT 5 D-sub plug 9-pin, length 2 m, 1 piece					<b>23204-187</b>
<b>Stainless steel front panel</b> to cover an unused shelf manger slot, width 15.22 mm, height 99.33 mm, incl. EMC gasketing, 1 piece					<b>21596-012</b>



12706021

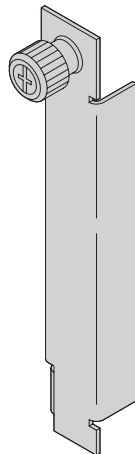
Cable

### Note

- Shelf manager in accordance with Intel NetStructure® MPCMM0002 (Chassis Management Module) on request
- User manual: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)



**For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)**  
oneClick code = Order no.



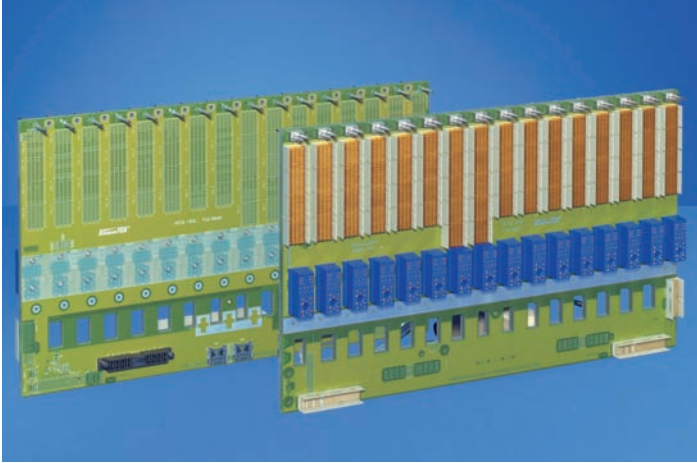
12706052

Steinless steel front panel



ServicePLUS see page 82

## Backplanes



12606003 12707058

- Backplanes with Dual Star and Full Mesh topology as standard
- Backplanes with Replicated Mesh and Dual Dual Star topology available on request
- Bused or radial intelligent platform management interface (IPMB)
- Redundant power supply, divided into up to four independent segments
- Point-to-point connection structure independent of protocol
- Data transfer rates at up to 10 Gbps
- I<sup>2</sup>C bus for internal monitoring
- Excellent eye pattern at up to 10 Gbps

### Note

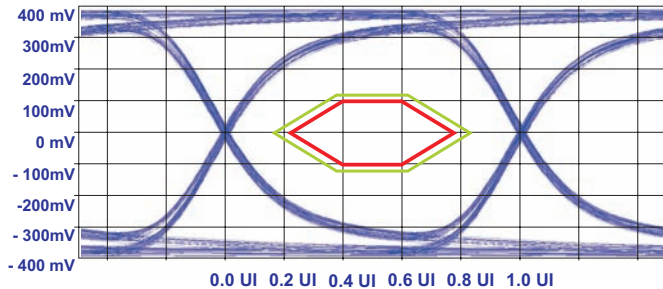
- For detailed description see chapter Standards, page 84



ServicePLUS see page 82

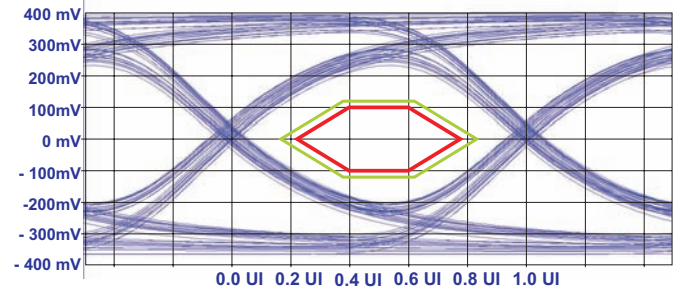
### Eye Pattern @ 3.125 Gbps vs. XAUI spec

Bit Pattern: PRBS    Data Rate: 3.125 Gbps    Pair: 01P21\_GH05-16P23\_EF03  
 Rise Time: 50ps    Pattern Length: 2<sup>17</sup>-1    trace info: na



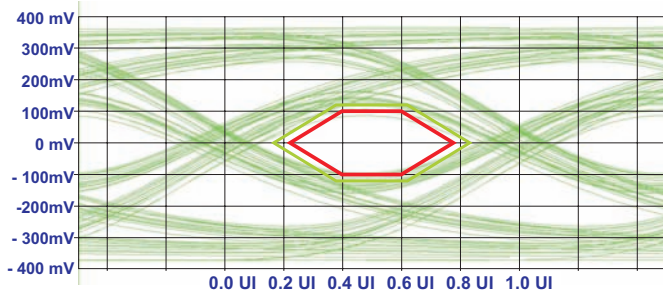
### Eye Pattern @ 6.25 Gbps vs. XAUI spec

Bit Pattern: PRBS    Data Rate: 6.25 Gbps    Pair: 01P21\_GH05-16P23\_EF03  
 Rise Time: 40ps    Pattern Length: 2<sup>17</sup>-1    trace info: na



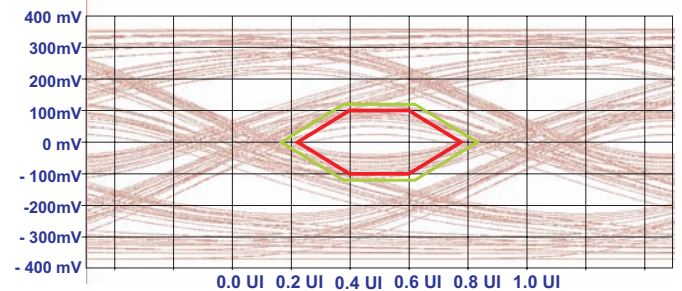
### Eye Pattern @ 10.0 Gbps vs. XAUI spec

Bit Pattern: PRBS    Data Rate: 10.0 Gbps    Pair: 01P21\_GH05-16P23\_EF03  
 Rise Time: 20ps    Pattern Length: 2<sup>17</sup>-1    trace info: na



### Eye Pattern @ 12.5 Gbps vs. XAUI spec

Bit Pattern: PRBS    Data Rate: 12.5 Gbps    Pair: 01P21\_GH05-16P23\_EF03  
 Rise Time: 20ps    Pattern Length: 2<sup>17</sup>-1    trace info: na





## AdvancedTCA front panel kit



Delivery exclusive of board

12705008

- Stainless steel or Al extrusion version
- Schroff hot-swap handle (AdvancedTCA handle or AdvancedTCA IEA handle)
- Special support for mounting the board on the components side
- EMC mesh gasketing

### Delivery comprises (kit)

Item	Qty	Description
1	1	Stainless steel or Al extrusion front panel incl. alignment pin and knurled screw M3
2	1	Bottom handle incl. bearing
3	1	Top handle incl. bearing
4	1	EMC mesh gasket
5	1	Assembly kit (M2.5 screws incl. thread locking compound)



AdvancedTCA handle

12706004

### Order Information

#### AdvancedTCA handle

Height U	Width HP	Description	Order no.
8	6	Front panel kit, stainless steel, with AdvancedTCA handle	<b>21591-100</b>
8	6	Front panel kit, Al extrusion, with AdvancedTCA handle	<b>21591-102</b>

- Description AdvancedTCA IEA handle see page 36



AdvancedTCA IEA handle

12707017

#### AdvancedTCA IEA handle

Height U	Width HP	Description	Order no.
8	6	Front panel kit, stainless steel, with AdvancedTCA IEA handle (plunger style)	<b>21596-324</b>
8	6	Front panel kit, stainless steel, with AdvancedTCA IEA handle (lever style)	<b>21596-325</b>

- Description AdvancedTCA IEA handle see page 35

### Note

- Front panels with Copperberyllium gasketing (CuBe), available on request
- Front panels with board cover on request
- Schroff offers an extensive modification service via the Front Panel Service, including customized cut-outs, foils and silk-screen printing: [www.schroff.biz/fpe](http://www.schroff.biz/fpe)
- CAD data: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)



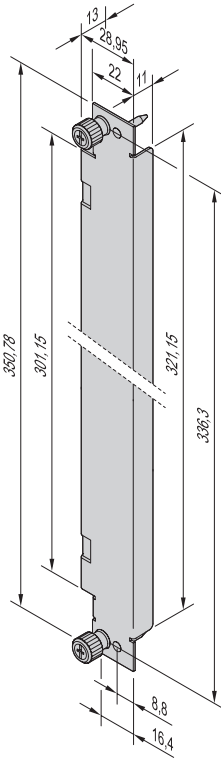
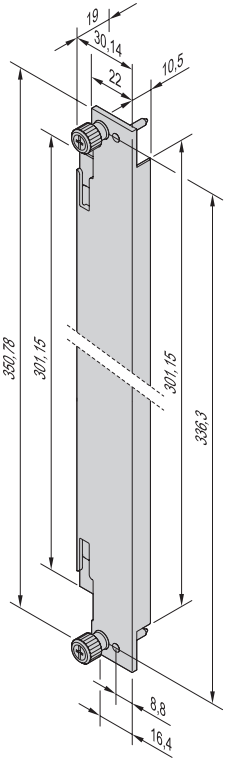
ServicePLUS see page 82

## FRONT PANEL FAST TRACK

## AdvancedTCA front panels

Al extrusion

Stainless steel



12705058 12705059

For plunger style



ServicePLUS see page 82

- Stainless steel or Al extrusion for EMC mesh gasketing

### Order Information

Height U	Width HP	Description	Qty/PU	Order no.
<b>AdvancedTCA front panels</b>				
8	6	Al extrusion for AdvancedTCA handle	1	<b>31591-454</b>
8	6	Al extrusion for AdvancedTCA IEA handle (plunger style)	1	<b>31596-575</b>
8	6	Al extrusion for AdvancedTCA IEA handle (lever style)	1	<b>31596-576</b>
8	6	Stainless steel, for AdvancedTCA handle and AdvancedTCA IEA handle (plunger style)	1	<b>31591-422</b>
8	6	Stainless steel, for AdvancedTCA handle and AdvancedTCA IEA handle (lever style)	1	<b>31596-423</b>
<b>Mesh gasketing, self-adhesive, for AdvancedTCA front panels PU 10 pieces</b>				<b>21591-092</b>

### Note

- CuBe gasketing on request
- Schroff offers an extensive modification service via the Front Panel Service, including customized cut-outs, foils and silk-screen printing: [www.schroff.biz/fpe](http://www.schroff.biz/fpe)
- Description AdvancedTCA IEA handle see page 35
- CAD data: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)

## FRONT PANEL FAST TRACK

### Front panel with integrated Side Two Cover



12706022

- For protection of components on solder side of backplane
- Customised version on request



ServicePLUS see page 82

## AdvancedTCA IEA handle



Intuitive **E**rgonomic **A**esthetic (IEA handle, plunger style) 12707017

- Innovative insertion/extraction mechanics
- Secure locking
- Ergonomic design
- For stainless steel and aluminium front panels
- Conforms to PICMG 3.0 R2.0
- For two different microswitch activations
  - Plunger style contact
  - Lever style contact

# NEW

**Delivery comprises** (assembled)

Item	Qty	Description
1	10	AdvancedTCA handle

### Order Information

Description	Order no.
Upper handle for microswitch with plunger	<b>20818-121</b>
Lower handle for microswitch with plunger	<b>20818-122</b>
Upper handle for microswitch with lever	<b>20818-123</b>
Lower handle for microswitch with lever	<b>20818-124</b>
<b>AdvancedTCA handle (IEA) design element</b> , plastic, transparent, to clip over customized logos, PU 10 pieces	<b>20818-140</b>

### Note

- CAD data: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)



**For further information** [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.

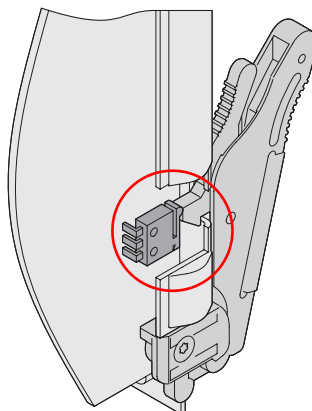
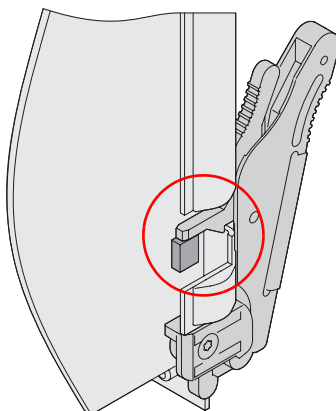
#### Handle for microswitches

With plunger-style contact

With lever-style contact

Underside of lever closes microswitch

Front tip of lever closes microswitch



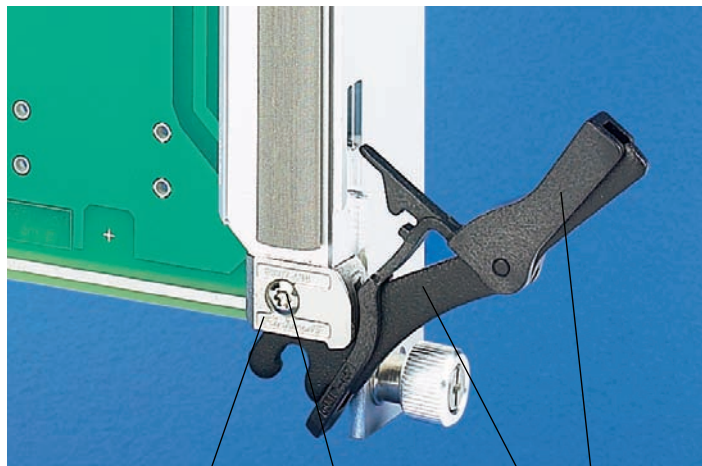
12707051 12707052



Design element for logos 12706024



ServicePLUS see page 82



3      4+5      1      2

12706004

## AdvancedTCA handles

- Secure locking
- For stainless steel and aluminium front panels
- In accordance with PICMG 3.0 R2.0
- For microswitch activation with plunger-style contact

### Delivery comprises (kit)

Item	Qty	Description
1	10	Lever, St, 2 mm, black
2	10	Plastic part, black
3	10	Die-cast bearing (top/bottom)
4	10	Screw M2.5 x 12, self-locking
5	10	Washer

### Order Information

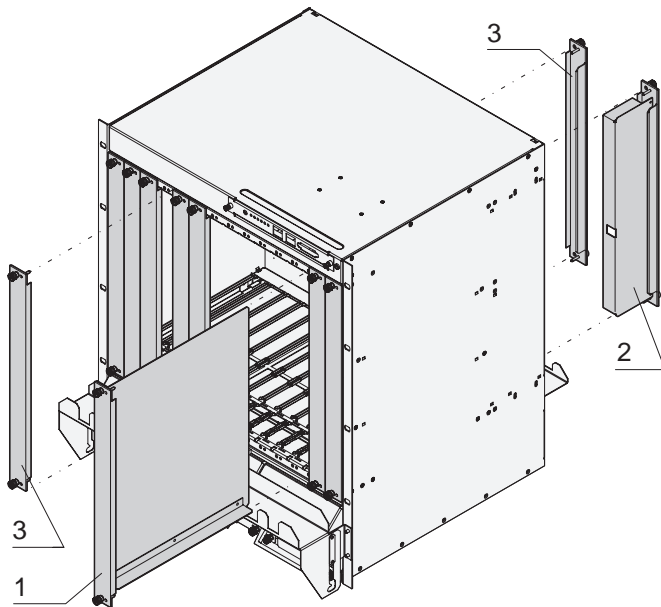
Description	Order no.
Lower handle assembly kit	<b>20817-476</b>
Upper handle assembly kit	<b>20817-477</b>
<b>Microswitch for carriers (mid-size AdvancedMC modules)</b> normally closed, for soldering (SMD), PU 10 pieces	<b>20817-853</b>

- CAD data: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)

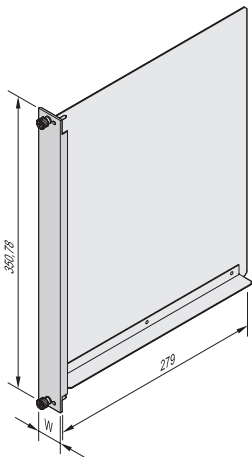


For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.

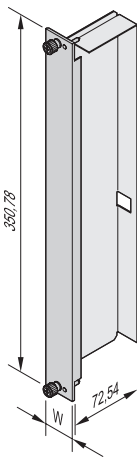
## AdvancedTCA front panels (filler panels)



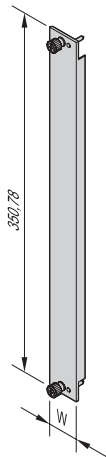
Item 1



Item 2



Item 3



12705062

12705064 12705061 12705063

- Front panels from stainless steel or Al extrusion
- 6 HP front panels in three versions
  - Front: Front panel with air baffle (item 1, air baffle blocks the air through unused slots not used)
  - Rear: Front panel with air baffle (item 2, air baffle blocks the air through unused slots not used)
  - Only front panel (item 3)

### Delivery comprises (kit)

Item	Qty	Description
1	1	Front panel
2	1	Air baffle (front or rear)

### Order Information

Item	Height U	Width HP	Depth mm	W mm	Description	Order no.
1	8	6	280	30.14	Front panel, Al extrusion, incl. air baffle with mesh gasketing	<b>21596-008</b>
1	8	6	280	28.95	Front panel, stainless steel, incl. air baffle with mesh gasketing	<b>21591-079</b>
2	8	6	70	30.14	Front panel, Al extrusion for rear I/O area incl. air baffle with mesh gasketing	<b>21591-107</b>
2	8	6	70	28.95	Front panel, stainless steel for rear I/O area incl. air baffle with mesh gasketing	<b>21591-099</b>
3	8	6	–	30.14	Al extrusion front panel with mesh gasketing	<b>21591-104</b>
3	8	6	–	28.95	Stainless steel front panel with mesh gasketing	<b>21591-097</b>

### Note

- Version with CuBe gasketing on request
- AdvancedMC carriers see page 42
- CAD data: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)



ServicePLUS see page 82



For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.

## Field replaceable units (FRUs)

Field replaceable units (FRUs) designate system components that can be exchanged on-site, thus reducing the downtime of the system to a minimum.

Schroff offers various FRU components for AdvancedTCA systems:

- Power entry modules
- Fan trays
- Air filter
- Shelf alarm panels
- Shelf alarm displays

## Power entry module for 12 U, 14 slot AdvancedTCA system



- Input 48 V<sub>DC</sub>/60 V<sub>DC</sub>
- Plugged-in at rear of chassis
- For 4 pairs of lines each (RTN and -48 V<sub>DC</sub>/-60 V<sub>DC</sub>) per input
- 8 fuses 30 A/80 V each

### Order Information

Description	Qty/PU	Order no.
Power entry module for 12 U, 14 slot AdvancedTCA system	1	<b>21596-003</b>
<b>Fuse 30 A/80 V for power entry module, PU 10 pieces</b>		<b>21191-207</b>

### Note

- Download of FRU files: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)
- AdvancedTCA systems see page 20

## Power entry module for 13 U, 14/16 slot AdvancedTCA system



- Input 48 V<sub>DC</sub>/60 V<sub>DC</sub>
- Plugged-in at rear of chassis
- For 4 pairs of lines each (RTN and -48 V<sub>DC</sub>/-60 V<sub>DC</sub>) per input
- 8 fuses 30 A/80 V each

### Order Information

Description	Qty/PU	Order no.
Power entry module for 13 U, 14/16 slot AdvancedTCA system	1	<b>21596-020</b>
<b>Fuse 30 A/80 V for power entry module, PU 10 pieces</b>		<b>21191-207</b>

### Note

- Download of FRU files: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)
- AdvancedTCA systems see from page 20

### Fan tray for 13 U, 14 slot AdvancedTCA system



- Fan tray with 3 radial fans ( $390 \text{ m}^3/\text{h} = 230 \text{ cfm}$ ) for cooling of front and rear boards in system
- Extractor handle and LED display (hot-swap, alarms, etc.)

#### Order Information

Description	Qty/PU	Order no.
Fan tray for 13 U, 14 slot systems (11596-10x)	1	<b>21596-139</b>

#### Note

- Download of FRU files: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)
- AdvancedTCA systems see page 21

### Fan tray for 13 U, 16 slot AdvancedTCA system



- Fan tray with 2 radial fans ( $390 \text{ m}^3/\text{h} = 230 \text{ cfm}$ ) for cooling of front and rear boards in system
- Extractor handle and LED display (hot-swap, alarms, etc.)

#### Order Information

Description	Qty/PU	Order no.
Fan tray for 13 U, 16 slot systems (11592-50x)	1	<b>21594-143</b>

#### Note

- Download of FRU files: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)
- AdvancedTCA systems see page 20

### Fan tray for 12 U, 14 slot AdvancedTCA system



- Fan tray with 2 fans ( $330 \text{ m}^3/\text{h} = 195 \text{ cfm}$  each) for cooling of front and rear boards in system
- Extractor handle and LED display (hot-swap, alarms, etc.)

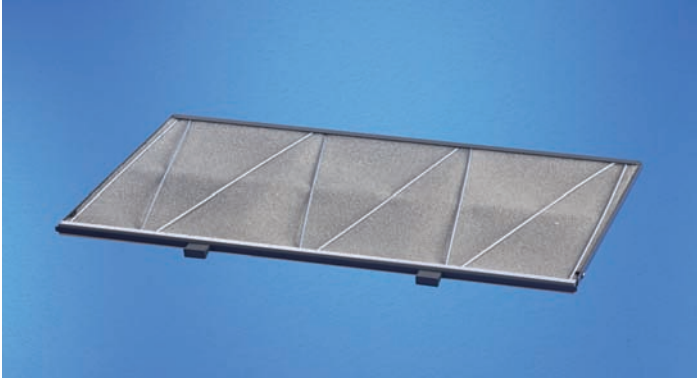
#### Order Information

Description	Qty/PU	Order no.
Fan tray for 12 U, 14 slot systems (115963x)	1	<b>21596-236</b>

#### Note

- Download of FRU files: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)
- AdvancedTCA systems see page 22

## Air filter for AdvancedTCA systems



12706005

### Order Information

Air filter	Qty/PU	Order no.
for 12 U, 14 slot systems (11592-40x, 11596-30x)	1	<b>21596-002</b>
for 13 U, 14 slot systems (11596-10x)	1	<b>21596-138</b>
for 13 U, 16 slot systems (11592-50x)	10	<b>21594-144</b>
for 6 U, 5 slot system (11596-045)	10	<b>21596-115</b>
for 5 U, 5 slot system (11596-012)	1	<b>21596-082</b>
for 3 U, 3 slot systems (11596-010, 11596-012)	1	<b>21596-037</b>
for 2 U, 2 slot system (11596-004)	1	<b>21596-028</b>

### Note

- CAD data: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)
- AdvancedTCA systems see from page 20

## Shelf alarm panel for 13 U, 14 slot AdvancedTCA system



12707004

- For output of all Telco alarm signals in accordance with the AdvancedTCA Specification
- One D-Sub connector

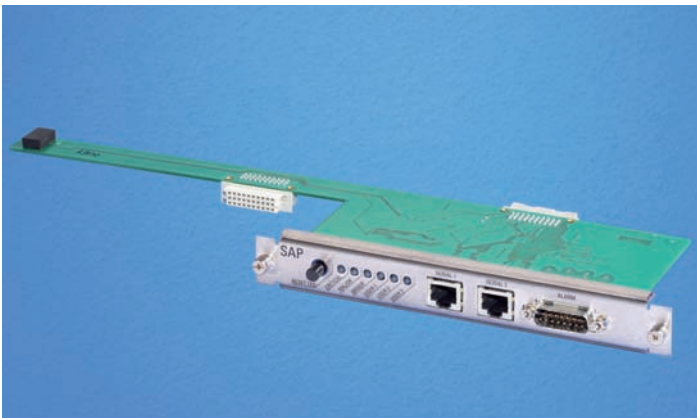
### Order Information

Description	Qty/PU	Order no.
Shelf alarm panel for 14 slot systems (1159610xx)	1	<b>21596-140</b>

### Note

- Download of FRU files: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)
- AdvancedTCA systems see page 21

## Shelf alarm panel for 12 U, 14 slot AdvancedTCA system



12706008

- For displaying all alarm signals in accordance with the AdvancedTCA Specification
- With alarm cut-off push button
- Two RJ 45 sockets, for connection of one serial console (serial interface of the two shelf managers)
- One D-Sub connector for Telco alarm

### Order Information

Description	Qty/PU	Order no.
Shelf alarm panel for 12 U, 14 slot systems (11592-40x, 11596-30x)	1	<b>21596-022</b>

### Note

- Download of FRU files: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)
- AdvancedTCA systems see page 22



### Shelf alarm panel for 13 U, 16 slot AdvancedTCA system



- For output of all Telco alarm signals in accordance with the AdvancedTCA Specification
- One D-Sub connector

#### Order Information

Description	Description	Qty/PU	Order no.
Shelf alarm panel	for 13 U, 16 slot systems (11592-50x)	1	<b>21596-025</b>

#### Note

- Download of FRU files: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)
- AdvancedTCA systems see page 20

### Shelf alarm display for 13 U AdvancedTCA system



- For displaying the Telco and fan tray alarm signals in accordance with the AdvancedTCA Specification
- With alarm cut-off push button
- Two RJ 45 sockets, for connection of one serial console (serial interface of the two shelf managers)

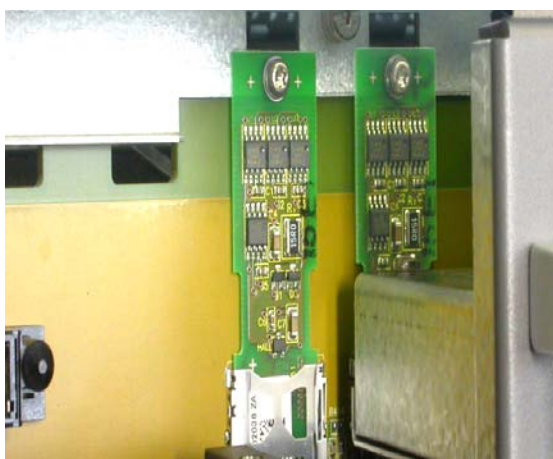
#### Order Information

Description	Description	Qty/PU	Order no.
Shelf alarm display	for 14 and 16 slot systems (11592-5xx, 11596-1xx)	1	<b>21596-026</b>

#### Note

- Download of FRU files: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)
- AdvancedTCA systems see page 20

### Chassis data module for 12 and 13 U AdvancedTCA systems



- SEEPROM for chassis FRU data (must be specifically programmed by user for the chassis)
- Temperature sensor for input temperature of chassis
- Hall sensor for filter mat ("air filter present")

#### Order Information

Description	Description	Qty/PU	Order no.
Chassis data module	for systems 11592-50x, 11596-30x, 11596-10x	1	<b>21596-023</b>

#### Note

- Download of FRU files: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)
- AdvancedTCA systems see from page 20

Overview ..... 2

- AdvancedTCA ..... 4
- MicroTCA ..... 6
- AdvancedMC ..... 8
- Applications ..... 10
- Systems ..... 12
- Chassis ..... 13
- Backplanes ..... 14
- Shelf manager ..... 15
- Cooling designs ..... 16

AdvancedTCA ..... 18

AdvancedMC carriers ..... 42

MicroTCA ..... 52

AdvancedMC modules ..... 68

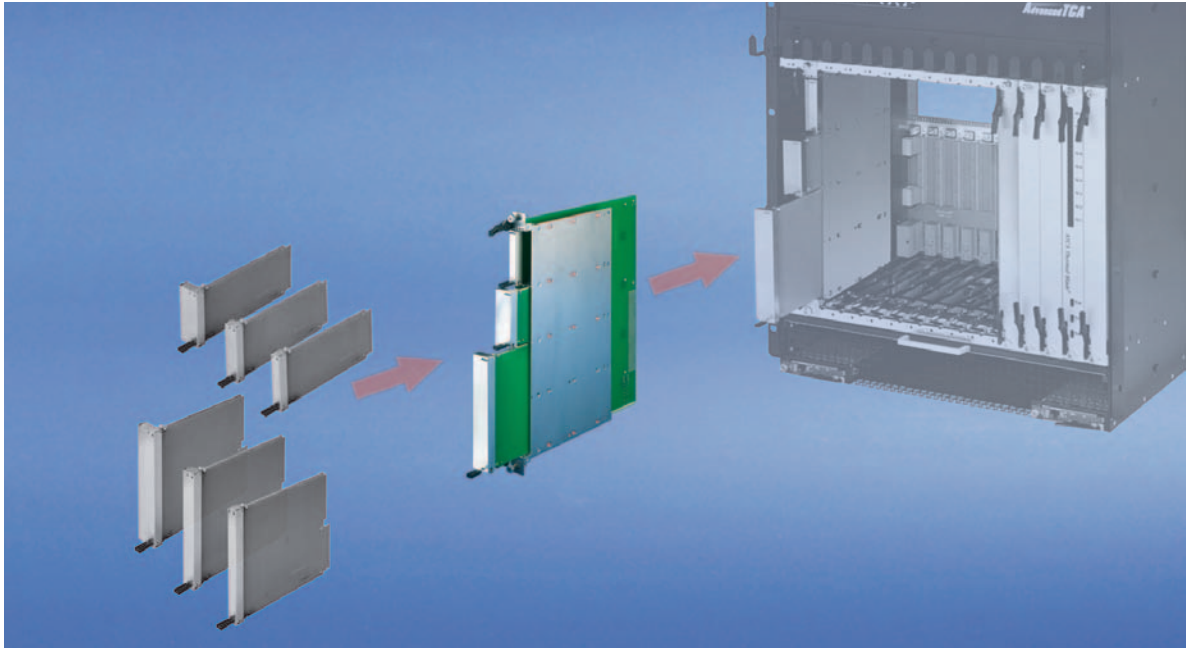
VARISTAR LHX 20 with air/water-heat exchanger... 74

Internet [www.a-tca.com](http://www.a-tca.com) .. 80

ServicePLUS ..... 82

Standards

- AdvancedTCA ..... 84
- MicroTCA ..... 86



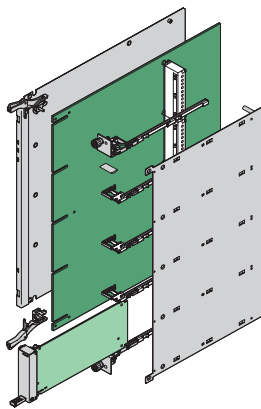
12806028

## AdvancedMC carriers

AdvancedMC carriers are plug-in units that are pushed into an AdvancedTCA system. They contain the carrier board that accepts AdvancedMC modules.

Electrical connection to the AdvancedTCA backplane is via connectors. With the fully-assembled AdvancedMC carrier in place, cost-effective additional functions may be integrated into the system.

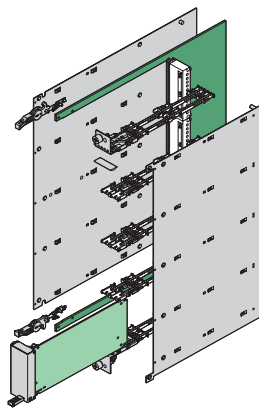
The standard stipulates three verschiedene mechanical versions, in accordance with PICMG Specification AMC.0 R2.0 RC1.2:



12805083

### Conventional carrier

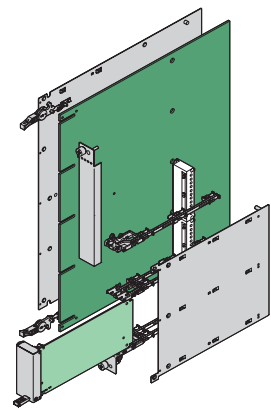
- Carrier board is continuous from front to rear
- Max. assembly: 4 single compact or 4 mid-size AdvancedMC modules
- Full-size AdvancedMC modules cannot be used



12805082

### Cutaway carrier

- Carrier board is cut away in the area of the AdvancedMC modules
- Max. assembly: 8 single compact or 4 single full-size AdvancedMC modules
- Combinations of full-size and compact modules are possible



12805081

### Hybrid carrier

- Carrier board is a combination of conventional and cutaway carrier
- Maximum number of assemblies depends on design of carrier
- Combinations of all AdvancedMC modules possible



## AdvancedMC carriers for AdvancedTCA systems

- Conventional, cutaway and hybrid carrier mechanisms for
  - Compact AdvancedMC carrier board
  - Mid-size AdvancedMC carrier board
  - Full-size AdvancedMC carrier board
- Standard versions from stock
- Individual carrier/module combinations to your requests

Overview . . . .42.

### Carrier mechanics

Carrier mechanics for compact and full-size AdvancedMC modules . . . . . 44

Carrier mechanics for compact and full-size AdvancedMC modules . . . . . 45

Card guide/struts for compact and mid-size modules 46

Differences between standard and MF handle for AMC carrier . . . . 47

Microswitch for carrier (compact and full-size modules) . . . . . 48

Carrier mechanics for hybrid boards . 49

Carrier mechanics for mid-size AdvancedMC modules, complete kit . . . . 50

Card guide/struts for compact and mid-size modules 51

Microswitch for carrier (mid-size AdvancedMC modules) . . . . . 51



12807020

### AdvancedMC carrier mechanics

- 1 slot plug-in unit, 8 U, 6 HP for AdvancedTCA systems
- Insertion/extraction handle for microswitch activation
- Versions
  - Carrier for compact and full-size modules
  - Carrier for mid-size modules
  - Hybrid carrier available on request

### AdvancedMC carrier accessories

- Board guides and struts
- ESD clips
- Carrier front handle
- Microswitches

### ServicePLUS offers

- assembly: Assembled by professionals. Double benefit!
- modification: Small changes. Large impact.
- express: When fast has to be faster.
- solution: Simple. Everything. From one source.
- support: Support. Solution. Availability.
- lifecycle: Bespoke service. For the entire life of the product.

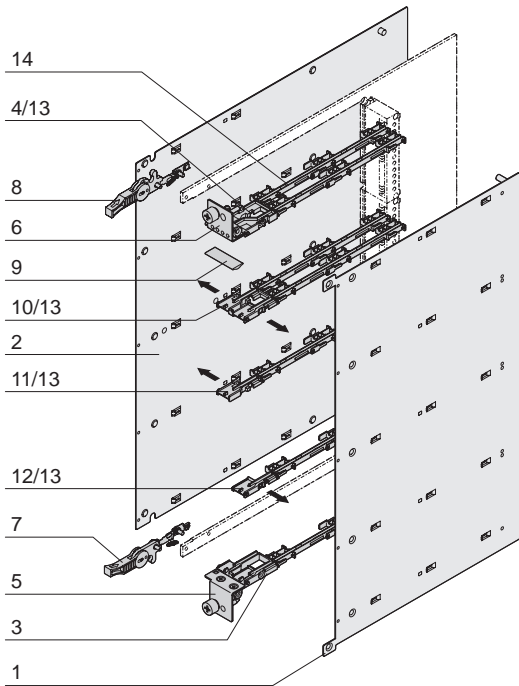


30407004

[www.schroff.biz/serviceplus/](http://www.schroff.biz/serviceplus/)



12805002



12807086



ServicePLUS see page 82

## Carrier mechanics for compact and full-size AdvancedMC modules

- Mechanics for cutaway carrier board (carrier **with** 3 different struts, guide rails, ESD clips)
- Stainless steel (EMC shielded)
- Width 1 slot (6 HP), height 8 U, in accordance with PICMG® AMC.0 R2.0 RC 1.2
- Insertion/extraction mechanics designed for hot-swap microswitch operation

### Delivery comprises (kit)

Item	Qty	Description
1	1	Cover B (on the right), stainless steel, 0.6 mm, insulated interior, exterior with protection film
2	1	Cover A (on the left), stainless steel, 0.6 mm, insulated interior, exterior with protection film
3	1	Lower splitting (strut), Zn die-cast, nickel-plated
4	1	Upper splitting (strut), Zn die-cast, nickel-plated
5	1	Lower front panel, stainless steel, 1 mm, pressed-in alignment pin and retention screws
6	1	Upper front panel, stainless steel, 1 mm, pressed-in alignment pin and retention screws, with holes for LEDs
7	1	Standard insertion/extraction handle, with microswitch operation, plastic lever, black
8	1	Standard insertion/extraction handle, plastic lever, black
9	1	EMC profile gasketing, core: foam, sleeve: textile cladding with CuNi coating
10	3	Support member between cover A and B
11	3	Support member for cover A (on the left)
12	3	Support member for cover B (on the right)
13	8	ESD clip (assembled at bottom )
14	10	AdvancedMC guide rail, PBT, UL 94 V-0, red
15	1	Assembly kit

### Order Information

Description	Order no.
Carrier mechanics for AdvancedMC compact and full-size modules <b>with</b> struts, ESD clips and guide rails	<b>10849-001</b>
<b>Microswitch, normally closed, for AdvancedMC carrier (compact and full-size modules)</b> for soldering (SMD), PU 10 pieces	<b>20849-236</b>
<b>Microswitch, normally open, for AdvancedMC carrier (compact and full-size modules)</b> for soldering (SMD), PU 10 pieces	<b>20849-235</b>

### Note

- Description of insertion/extraction handle see page 47
- Description of microswitch see page 48
- AdvancedMC module mechanics, see page 68

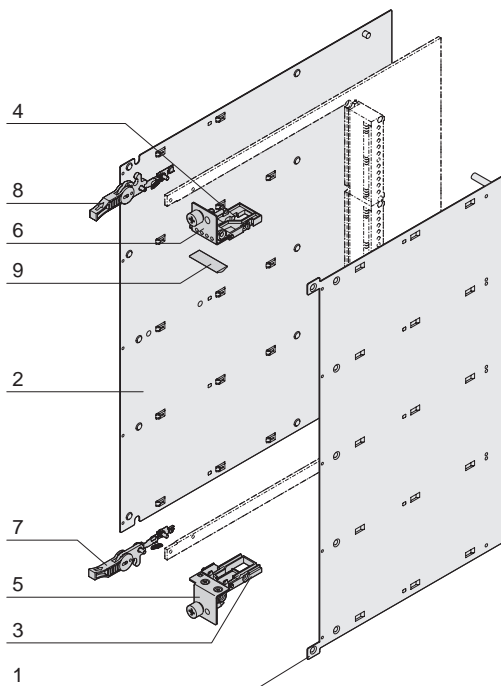


For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.

## Carrier mechanics for compact and full-size AdvancedMC modules



12807021



12805053

- Mechanics for cutaway carrier board (carrier **without** struts, guide rails, ESD clips, for individual assembly)
- Stainless steel (EMC shielded)
- Width 1 slot (6 HP), height 8 U, in accordance with PICMG® AMC.0 R2.0 RC1.2
- Insertion/extraction mechanics designed for hot-swap microswitch operation

### Delivery comprises (kit)

Item	Qty	Description
1	1	Cover B (on the right), stainless steel, 0.6 mm, insulated interior, exterior with protection film
2	1	Cover A (on the left), stainless steel, 0.6 mm, insulated interior, exterior with protection film
3	1	Lower splitting (strut), Zn die-cast, nickel-plated
4	1	Upper splitting (strut), Zn die-cast, nickel-plated
5	1	Lower front panel, stainless steel, 1 mm, pressed-in alignment pin and retention screws
6	1	Upper front panel, stainless steel, 1 mm, pressed-in alignment pin and retention screws, with holes for LEDs
7	1	Standard insertion/extraction handle, with microswitch operation, plastic lever, black
8	1	Standard insertion/extraction handle, plastic lever, black
9	1	EMC profile gasketing, core: foam, sleeve: textile cladding with CuNi coating
10	1	Assembly kit

### Order Information

Description	Order no.
Carrier mechanics for AdvancedMC compact and full-size modules without struts, ESD clips and guide rails	<b>10849-002</b>
<b>Microswitch, normally closed, for AdvancedMC carrier (compact and full-size modules)</b> for soldering (SMD), PU 10 pieces	<b>20849-236</b>
<b>Microswitch, normally open, for AdvancedMC carrier (compact and full-size modules)</b> for soldering (SMD), PU 10 pieces	<b>20849-235</b>

### Note

- Please order further struts, ESD clips and guide rails separately, see page 46
- Description of insertion/extraction handle see page 47
- Description of microswitch see page 48
- AdvancedMC module mechanics see page 68

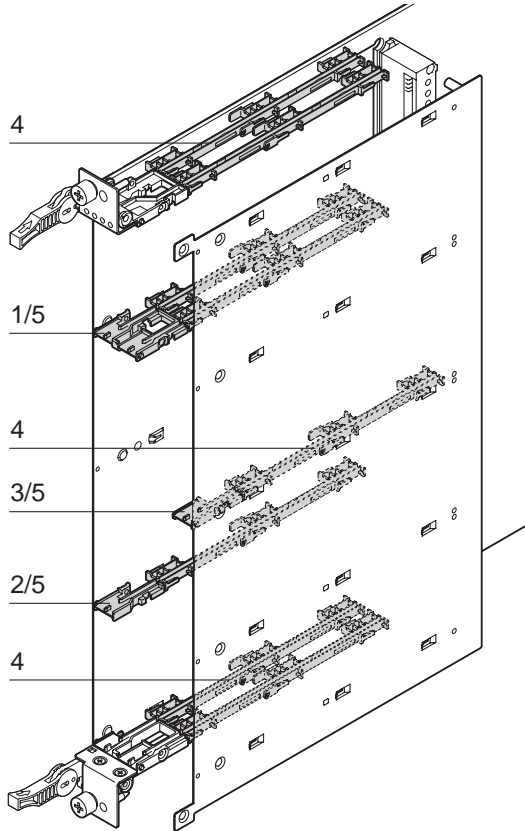


ServicePLUS see page 82



For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.

## Board guidance/struts for AdvancedMC compact and full-size modules



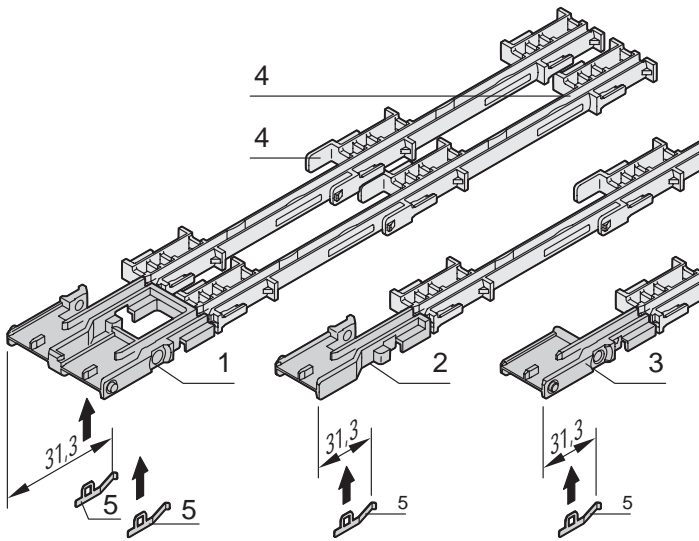
- Board guiding is always done with a splitting (strut) and guide rail
- Three different struts
  - Strut is assembled between the cover plates A and B
  - Strut is assembled on the left on cover plate A
  - Strut is assembled on the right on cover plate B
- ESD clip is pushed into strut (one piece each per guide rail)
- Guide rails are clipped into the cover

### Order Information

Item	Description	Qty/PU	Order no.
1	Strut between cover A (left) and B (right), Zn die-cast, nickel-plated	10	<b>20849-009</b>
2	Splitting (strut) for cover A (on the left), Zn die-cast, nickel-plated	10	<b>20849-010</b>
3	Splitting (strut) for cover B (on the right), Zn die-cast, nickel-plated	10	<b>20849-011</b>
4	AdvancedMC guide rail, PBT, UL 94 V-0, red	10	<b>20849-008</b>
5	ESD clip, spring steel, corrosion-free, for deflection of electrostatic charges	50	<b>20849-021</b>



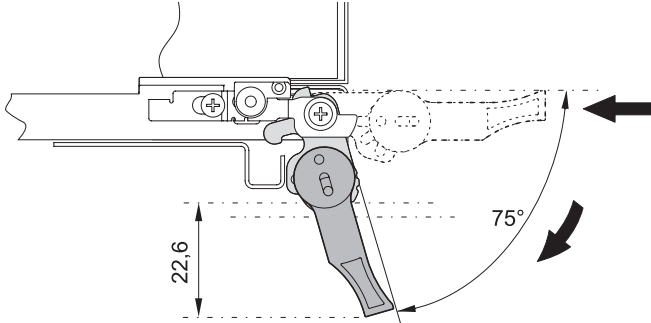
For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.



12805071

## Differences between standard and MF handle for AdvancedMC carrier (compact and full-size modules)

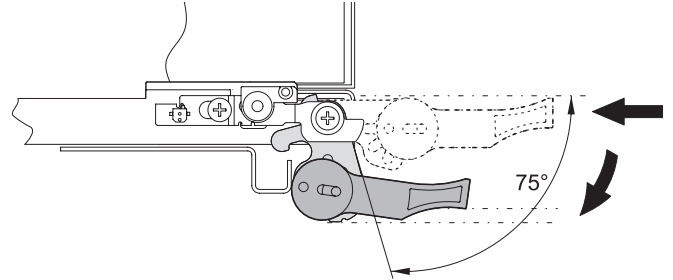
**Standard front handle** - is included in delivery of carriers for compact and full-size modules



- Extractor handle 75° opening angle
- Insertion/extraction in one step
- Swing range: 23 mm below and above the pitch line
- Included in delivery of carrier

12806063

**MF handle** - can be exchanged by standard handle if needed (available on request)



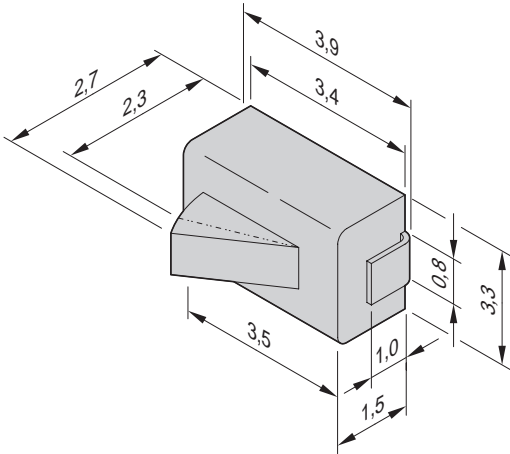
- Extractor handle 75° opening angle
- Insertion/extraction in three steps (2 operations)
- Small swing range (0 mm) below and above the pitch line. The lower respectively upper limit of the carrier is not exceeded during extraction.

12805072

## Microswitch for carrier (compact and full-size AdvancedMC modules)

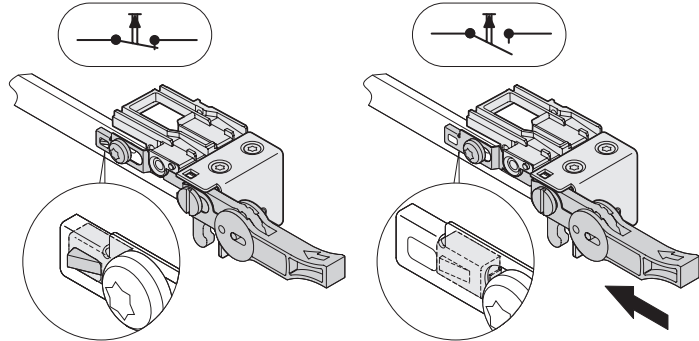
■ Microswitch to solder in (SMD)

# NEW



12807066

"Normally closed"

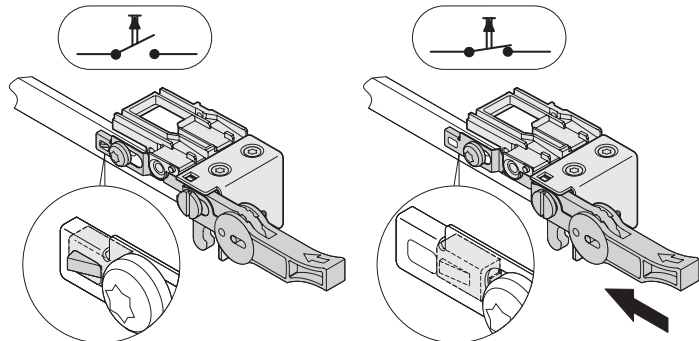


12807081

Handle in inoperative position

Handle activated

"Normally open"



12807082

Handle in inoperative position

Handle activated

### Order Information

Description	Qty/PU	Order no.
Microswitch, <b>normally closed</b> , for AdvancedMC carrier (compact and full-size modules)	10	<b>20849-236</b>
Microswitch, <b>normally open</b> , for AdvancedMC carrier (compact and full-size modules)	10	<b>20849-235</b>

### Technical data

Max. switch current	15 mA
Operating temperature	-15 °C ... +70 °C
Electrical life	10 <sup>5</sup>



For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.



## AdvancedMC Carrier mechanics for hybrid boards



12806017

- The carrier board is a combination of conventional and cutaway carrier
- Maximum number of assemblies depends on design of carrier
- Available on request



ServicePLUS see page 82

## Carrier mechanics for mid-size AdvancedMC modules, complete kit



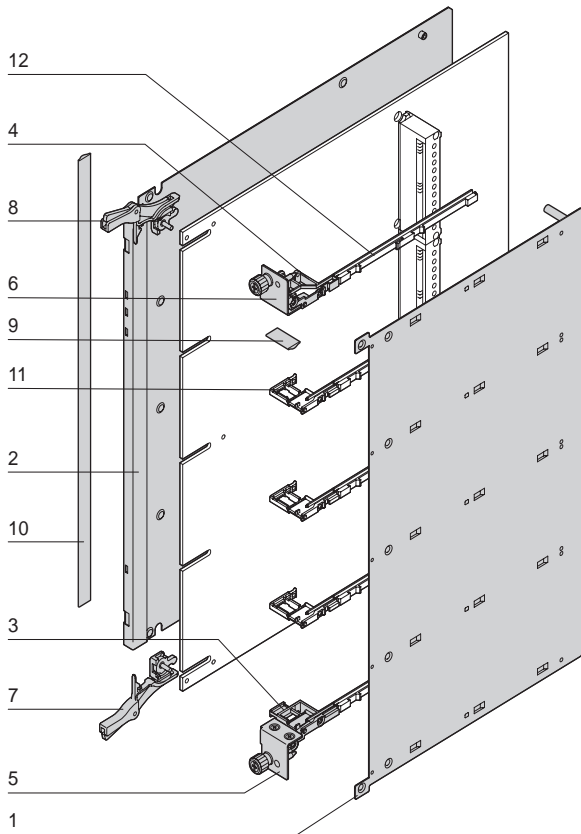
1280601012806012

- Mechanics for conventional carrier, stainless steel (EMC shielded)
- Width 1 slot (6 HP), height 8 U, in accordance with PICMG® AMC.0 R2.0 RC 1.2
- Insertion/extraction handle designed for hot-swap microswitch operation
- Carrier mechanics with struts and guide rails for four modules

### Delivery comprises (kit)

Item	Qty	Description
1	1	Cover B (on the right), stainless steel, 0.6 mm, insulated interior, exterior with protection film
2	1	Cover A (on the left), stainless steel, 0.6 mm, insulated interior, exterior with protection film
3	1	Lower splitting (strut), Zn die-cast, nickel-plated
4	1	Upper splitting (strut), Zn die-cast, nickel-plated
5	1	Lower front panel, stainless steel, 1 mm, pressed in alignment pin and retention screws
6	1	Upper front panel, stainless steel, 1 mm, pressed in alignment pin and retention screws
7	1	AdvancedTCA insertion/extractor handle, with microswitch operation, plastic lever, black
8	1	AdvancedTCA insertion/extractor handle, with microswitch operation, plastic lever, black
9	1	EMC profile gasketing, core: foam, sleeve: textile cladding with CuNi coating
10	1	EMC profile gasketing, core: foam, sleeve: textile cladding with CuNi coating
11	3	Splitting between covers A and B (4 ESD clips)
12	5	AdvancedMC guide rail, PBT, UL 94 V-0, green
13	1	Assembly kit

For conventional board/mid-size module



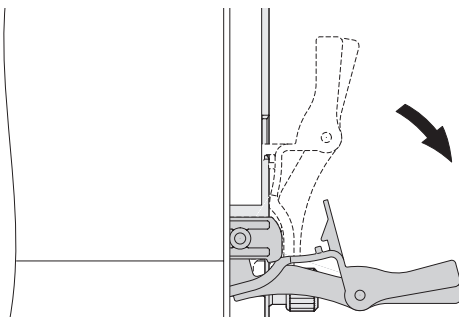
12806054

### Order Information

Description	Order no.
AdvancedMC carrier mechanics for mid-size AdvancedMC modules with support member, ESD clips, guide rails	<b>10849-003</b>
<b>Microswitch for carriers (mid-size AdvancedMC modules)</b> "normally closed" for soldering (SMD), PU 10 pieces	<b>20817-853</b>

### Note

- Handle in Southco design on request
- Carrier with stronger cover plate A (1 mm) available on request
- Carrier for compact AdvancedMC modules available on request
- Description of microswitch see page 51
- AdvancedMC module mechanics, see page 68




12806060

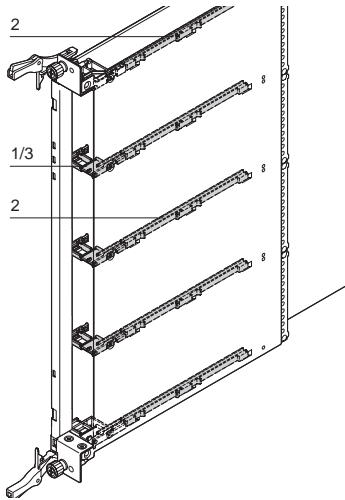
Handle



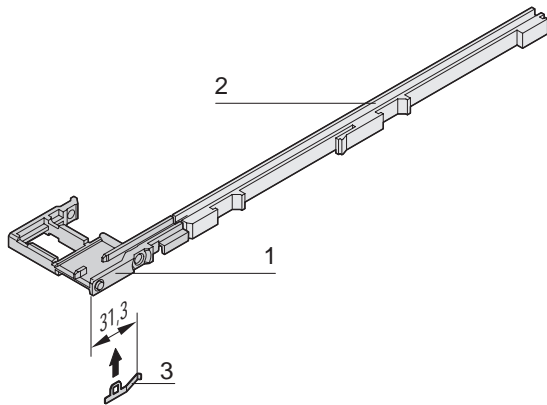
ServicePLUS see page 82

 **For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)**  
oneClick code = Order no.

## Guide rails/struts for AdvancedMC mid-size modules



12806061



12806062

- Board guiding is always done with support member (strut) and guide rail
- Support member (strut) assembled between the covers A and B
- ESD clip is pushed into strut (1 piece each)
- Guide rails are clipped into the cover

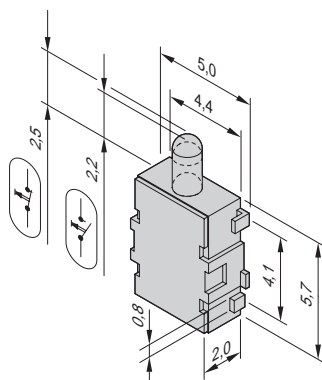
### Order Information

Item	Description	Qty/PU	Order no.
1	Strut between cover A (left) and B (right), Zn die-cast, nickel-plated	10	<b>20849-242</b>
2	AdvancedMC guide rail for mid-size carrier, PBT, UL 94 V-0, green	10	<b>20849-166</b>
3	ESD clip, spring steel, corrosion-free, for deflection of electrostatic charges	50	<b>20849-021</b>

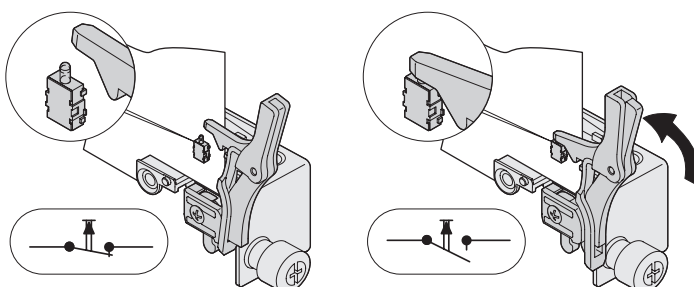


For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.

## Microswitch for carriers (mid-size AdvancedMC modules)



12807071



12807079

- Microswitch to solder in (SMD)

### Order Information

Description	Qty/PU	Order no.
Microswitch ( <b>normally closed</b> ) for carrier (mid-size AdvancedMC modules)	10	<b>20817-853</b>

### Dimensions

Max. switch current	100 mA, 12 V <sub>DC</sub>
Operating temperature	-20 °C ... +60 °C
Electrical lifespan	5 x 10 <sup>5</sup>



For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.

**Overview** ..... 2

- AdvancedTCA ..... 4
- MicroTCA ..... 6
- AdvancedMC ..... 8
- Applications ..... 10
- Systems ..... 12
- Chassis ..... 13
- Backplanes ..... 14
- Shelf manager ..... 15
- Cooling designs ..... 16

**AdvancedTCA** ..... 18

**AdvancedMC carriers** ..... 42

**MicroTCA** ..... 52

**AdvancedMC modules** ..... 68

**VARISTAR LHX 20 with air/water-heat exchanger**... 74

**Internet www.a-tca.com** .. 80

**ServicePLUS** ..... 82

**Standards**

- AdvancedTCA ..... 84
- MicroTCA ..... 86



12907003

## MicroTCA (Micro Telecommunications Computing Architecture)

MicroTCA.0 R1.0 is a modular standard for plugging AdvancedMC modules directly into a backplane. As well as standard systems and modifications, Schroff also offers all individual components for system building.

A so-called MicroTCA carrier hub (MCH) is needed to operate the AdvancedMC modules. In addition to the management function it also takes over the switch function.

The management includes temperature, voltage and fan monitoring. By remote diagnosis problems can be identified at an early stage and thus downtimes can be reduced.

## Applications

Lower development costs and shorter time-to-market are the advantages of the MicroTCA standard compared to proprietary system solutions, as they can be found increasingly often in today's telecommunications.

Among others the advantages over the previous bus systems (VME, CompactPCI busses) are higher speed, smaller designs and larger flexibility.

MicroTCA is used in environments where faster data transfer rates are required and large data volumes must be processed in the shortest time, e.g. in telecommunications, automation, image processing, medical technology, defence systems etc.

## Heat dissipation

MicroTCA systems can be cooled by push or pull cooling.  
 Push cooling: The fan is situated by the air inlet and pushes air through the system.  
 Pull cooling: The fan is situated by the air outlet and sucks air through the system.

The dimensions of the fans are such that the heat loss of up to 80 W per full-size AdvancedMC module (maximum 12 modules) can be safely dissipated.

## Modular MicroTCA high speed systems

- Large product range with regard to dimensions, number of slots, cooling designs, backplane topologies
- From simple subrack to integrated system
- Modifications to your requests



Overview . . . .52

### Development systems

6 U (9 single full-size) and 8 U (9 double full-size) . . . . .54  
 Backplanes for development systems . . . . .55

### Systems

6 U, for 9 single full-size AdvancedMC modules . . . . .56  
 3 U, for 2 single and 4 double (8 single) full-size AdvancedMC modules . . . . .57  
 3 U industrial cube for 4 single full-size modules. . . . .58

### 19" subracks

3 and 4 U for single or double AdvancedMC modules . . . . .59  
 Backplanes . . . . .60  
 Mounting rail for 3 U backplane in 4 U subrack. . . . .61

### Accessories

Mounting aid for guide rails . . . . .61  
 Guide rails . . . . .61  
 Power input module, single full-size module . . .63  
 Filler modules. . . . .64  
 Field replaceable units (FRUs) . . . . .66

### MicroTCA development systems

- For single and double full-size AdvancedMC modules
- Active fan cooling
- Backplane with Dual Star topology
- Power supply units



12806020

### MicroTCA systems

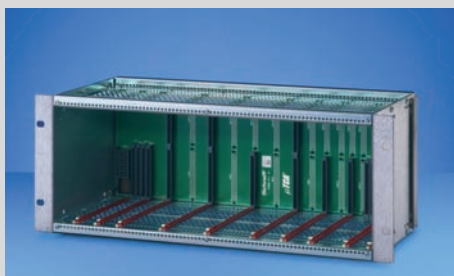
- Different designs
- For single and double AdvancedMC modules
- Active fan cooling
- Backplanes with different topologies
- Power supply



12907002

### MicroTCA subracks

- For single and double AdvancedMC modules
- Backplane with star topology



12806022

### ServicePLUS (more details see page 82)

- configuration: Simple. Fast. To the ideal product.
- assembly: Assembled by professionals. Double benefit!
- modification: Small changes. Large impact.
- solution: Simple. Everything. From one source.
- support: Support. Solution. Availability.
- academy: Knowledge. Sharing. Partnerships.
- lifecycle: Bespoke service. For the entire life of the product.



30407004

[www.schroff.biz/serviceplus/](http://www.schroff.biz/serviceplus/)

## Development systems, 6 U (9 single full-size) and 8 U (9 double full-size)



6 U system

12806021



8 U system

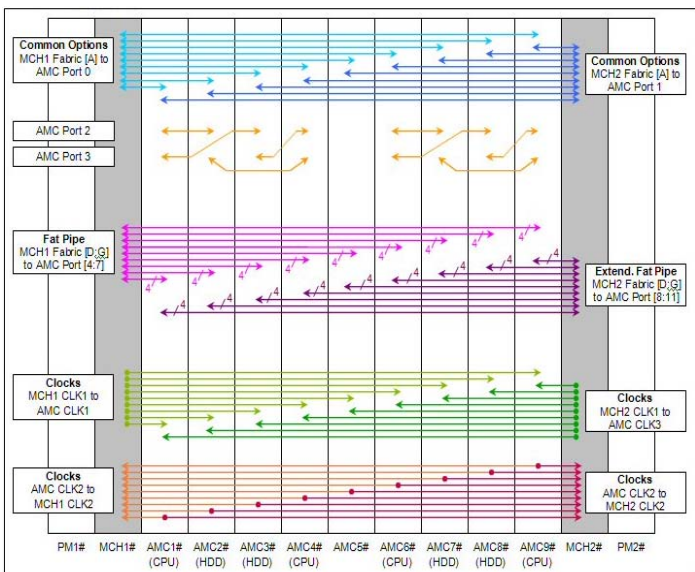
12806020

- In accordance with PICMG MicroTCA.0 R1.0 Specification
- Case system with handle (19" bracket available on request), 316 mm deep, RAL 9006, completely assembled and wired, assembly space for 2 power modules (9 HP) and 2 MCHs and 9 AdvancedMC modules, **2 heights**
  - 6 U, for 9 **single** full-size AdvancedMC modules
  - 8 U, for 9 **double** full-size AdvancedMC modules
- Backplane, Dual Star connections for Gigabit Ethernet (GbE) and fat pipe/extended fat pipe, direct connections for the storage interface
- Power supply units
  - 2 slots for MicroTCA power modules with up to 9 HP width or Schroff power input module
  - 2 power supply slots to accommodate Schroff plug-in power supplies, AC wide range input and DC output (12 V<sub>DC</sub> or -48 V<sub>DC</sub>)
- Active cooling
  - Hot-swap fan tray with three 12 V<sub>DC</sub> fans, temperature dependent control available on request
  - Air circulation from front to rear
  - Air filter (exchangeable from front)
  - Optional fan control with NTC resistor (position selectable within system)

**NEW**

### Order Information

Description	Backplane Slots	Qty/PU	Order no.
Development system for 9 <b>single</b> full-size AdvancedMC modules	9 full-size, 2 x PM (9 HP), 2 x MCH	1	<b>11850-005</b>
Development system for 9 <b>double</b> full-size AdvancedMC modules	9 full-size, 2 x PM (9 HP), 2 x MCH	1	<b>11850-007</b>
<b>Power supply 300 W, AC-DC (12 V)</b> Input 85 ... 264 V <sub>AC</sub> , output 12 V <sub>DC</sub> /25A, 1 piece			<b>11098-287</b>
<b>Power supply 300 W, AC-DC (-48 V<sub>DC</sub>)</b> Input 85 ... 264 V <sub>AC</sub> , output -48 V <sub>DC</sub> /6.25 A, 1 piece			<b>11098-288</b>
<b>Connection cable</b> Power supply, 12 V <sub>DC</sub> output to power input module, length 260 mm, 1 piece			<b>23204-176</b>
<b>Connection cable</b> Power supply, 12 V <sub>DC</sub> output to power input module, length 550 mm, 1 piece			<b>23204-182</b>
<b>Connection cable</b> Power supply, -48 V <sub>DC</sub> output to power input module, length 260 mm, 1 piece			<b>23204-177</b>
<b>MicroTCA power input module, single full-size</b> MicroTCA power input module, single full-size 6 HP, 1 piece see page 63			<b>23098-561</b>
<b>Connection cable</b> from power supply module (-12 V <sub>DC</sub> ) to ring cable eye M5, length 2 m, 1 pce			<b>23204-802</b>
<b>Connection cable</b> from power supply module (-48 V <sub>DC</sub> ) to ring cable eye M4, length 2 m, 1 pce			<b>23204-803</b>



Backplane topology

12806805

- Description MicroTCA backplane see page 55
- Replacement parts (FRUs) see from page 66
- User manual: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)



ServicePLUS see page 82

## MicroTCA backplanes for development systems



12607001

- In accordance with PICMG MicroTCA.0 R1.0
- Dual Star topology on ports 0/1 and ports 4 ... 7/8 ... 11
- Direct connections on ports 2 and 3
- Carrier FRU SEEPROM and carrier number 2x on rear side of backplane, connected to the MCHs via I<sup>2</sup>C bus

# NEW

### Delivery comprises

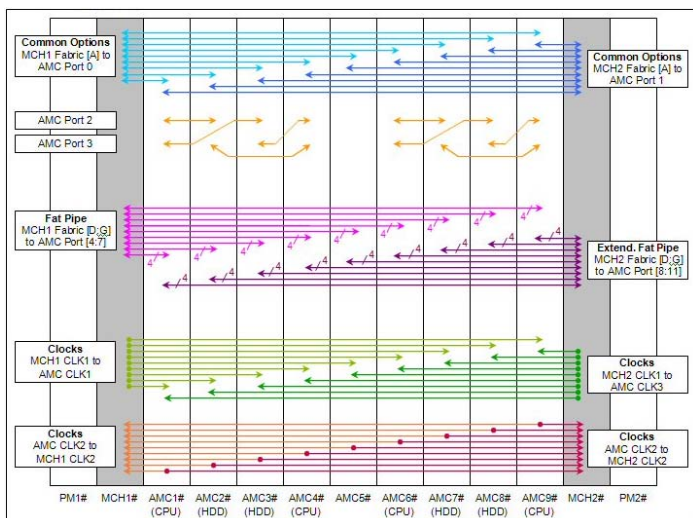
Item	Qty	Description
1	1	Backplane

### Order Information

Slots	AMC	Width mm	Height mm	Description	Order no.
9		425.0	169.9	9 full-size AdvancedMC slots, 2 MCH slots, 2 PM slots (9 HP)	<b>23005-419</b>

### Dimensions

Slots	9 AdvancedMC single full-size slots, 2 redundant MicroTCA carrier hub (MCH) slots, 2 redundant power module (PM) slots 9 HP
IPMB	Radial IPMI from both MCH slots to all AdvancedMC slots; bused, redundant IPMB to the cooling unit (CU) and power module (PM) slots
Clock connections	CLK1: radial from MCH1 to all AdvancedMC slots CLK2: radial from each AdvancedMC slot to both MCH slots, incl. serial termination CLK3: radial from MCH2 to all AdvancedMC slots
Common options	AdvancedMC port 0 in star form to MCH1; AdvancedMC port 1 in star form to MCH2; AdvancedMC ports 2, 3 direct connection between the AMC slots
Data ports	Fat pipe ports 4 ... 7: radial connection from MCH1 to all AMC slots Extended fat pipe ports 8 ... 11: radial connections from MCH2 to all AdvancedMC slots



12806805



ServicePLUS see page 82

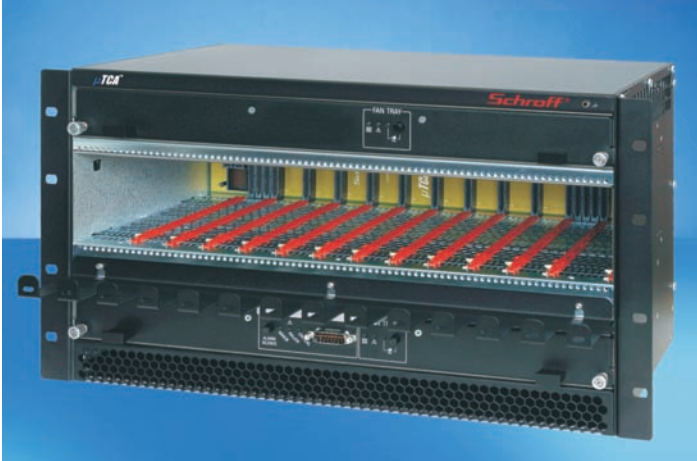
### Note

- User manual: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)

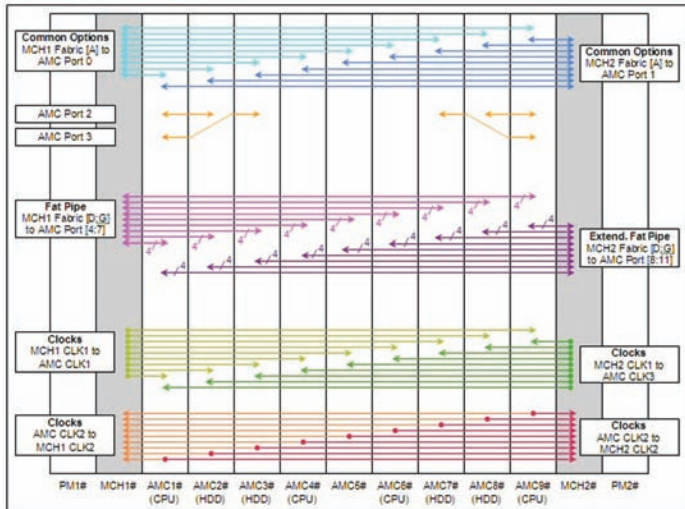


For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.

## 6 U systems, for 9 single full-size AdvancedMC modules



12907002



12806805

Backplane topology



ServicePLUS see page 82

- in accordance with PICMG MicroTCA.0 R1.0 Specification
- 19" subrack system, 6 U, 197 mm deep, black, fully assembled and wired; cable channel; assembly space for
  - 9 single full-size modules
  - 2 power modules (9 HP)
  - 2 MCH single full-size slots
- Backplane, dual star connection for GbE and fat pipe/extended fat pipe, direct connections for the storage interface
- Power supply, 2 possibilities
  - MicroTCA power modules (up to 9 HP width)
  - Schroff power supply module (single full-size, 6 HP)
- Active cooling
  - 2 frame-type fan plug-in units, insertable from front (push-pull cooling), each with cooling unit enhanced module management controller (CU EMMC); lower fan unit with interface and display for Telco alarms
  - Air circulation from the front upwards, to the sides and to the rear
  - Air filter (exchangeable from front)

**NEW**

### Order Information

Description	Qty/PU	Order no.
MicroTCA system for 9 single full-size AdvancedMC modules	1	<b>10849-005</b>
<b>MicroTCA power input module, single full-size</b> 6 HP, 1 piece		<b>23098-561</b>

### Note

- For description of the power supply module see page 63
- Replacement parts (FRUs) see from page 66
- User manual: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)



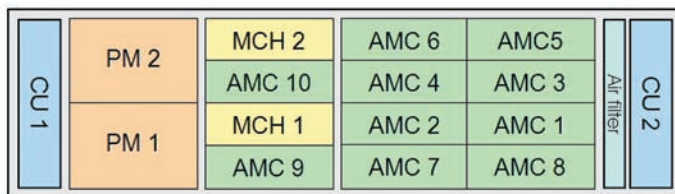
For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.



### 3 U systems, for 2 single and 4 double (8 single) full-size AdvancedMC modules

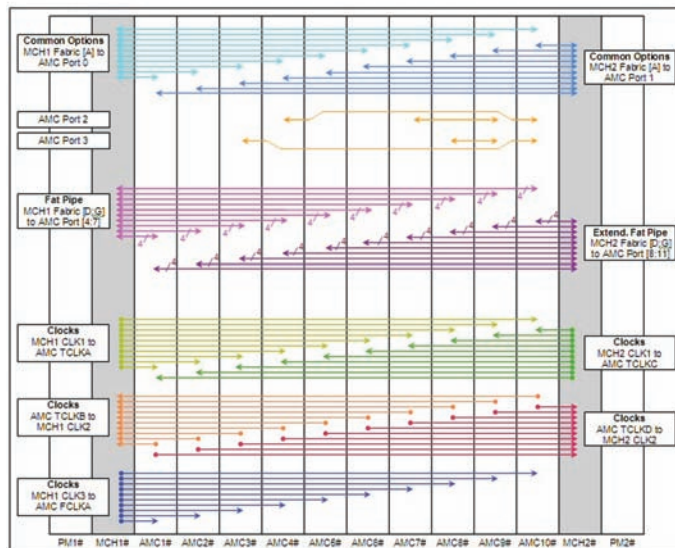


12907001



12907050

Slot allocation



12907051

Backplane topology



ServicePLUS see page 82

- In accordance with PICMG MicroTCA.0 R1.0 Specification
- 19" subrack system, 3 U, 215 mm deep, with horizontal board mounting, black, fully assembled and wired; slots see drawing; 3 board assembly spaces
  - On the left for 2 power modules of up to 12 HP width
  - In the centre for 2 MCHs and 2 single full-size AdvancedMC modules
  - On the right for 4 double full-size-modules or, with splitting kits supplied, 8 single full-size-modules
- MicroTCA backplane
  - Dual star connection for GbE and fat pipe/extended fat pipe, direct connections for the storage interface
- Power supply, 2 possibilities
  - MicroTCA power modules (up to 12 HP width)
  - Schroff power supply module (single full-size, 6 HP)
- Active cooling
  - 2 frame-type fan plug-in units, insertable from front (push-pull cooling), each with cooling unit enhanced module management controller (CU EMMC)
  - Air circulation from right to left
  - Air filter (exchangeable from front)

**NEW**

#### Order Information

Description	Qty/PU	Order no.
MicroTCA system for 2 single and 4 double full-size AdvancedMC modules	1	<b>11850-011</b>
<b>MicroTCA power input module, single full-size 6 HP, 1 piece</b>		<b>23098-561</b>

#### Note

- For description of the power supply module see page 63
- Replacement parts (FRUs) see from page 66
- User manual: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)



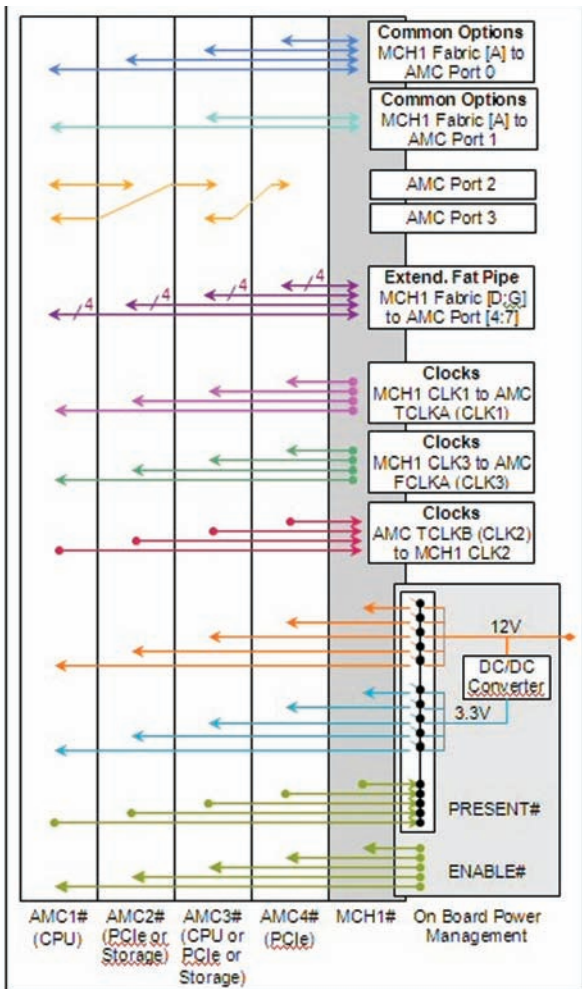
For further information [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)  
oneClick code = Order no.

**Industrial cube for 4 single full-size AdvancedMC modules**



12907011

- Conforms to PICMG MicroTCA.0 R1.0 Specification
- Cube system for 4 single full-size modules and 1 MCH module, single full-size; 2 designs:
  - Subrack system, width 156.76 mm, height 150 mm, depth 250 mm
  - Case system (ratiopacPRO), width 175.85 mm, height 132.45 mm, depth 315.5 mm
- Backplane, MicroTCA, star connection for GbE and fat pipe, direct connections for the storage interface
- Open frame power supply, 150 W, mains/line connection on the rear with IEC connector, switch-off logic device for individual slots on the backplane
- Active cooling
  - 2 fans
  - Air circulation for subrack upwards from below, for case system from below to rear



12907053

Backplane topology



ServicePLUS see page 82

**Order Information**

Description	Backplane Slots	Qty/PU	Order no.
MicroTCA case system for 4 single full-size AdvancedMC modules	4 full-size, 1 x MCH	1	<b>21850-045</b>
MicroTCA subrack system for 4 single full-size AdvancedMC modules	4 full-size, 1 x MCH	1	<b>21850-046</b>

**Note**

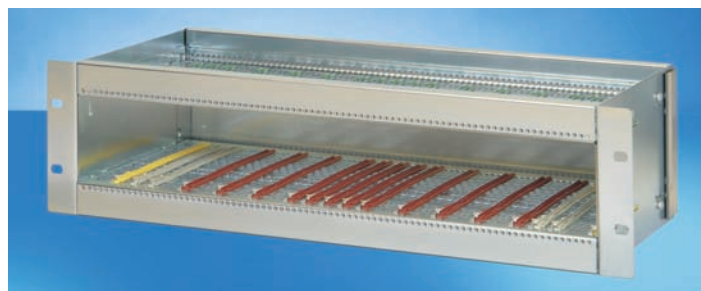
- User manual: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)



**For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)**  
oneClick code = Order no.

## 19" subrack, for single or double AdvancedMC modules

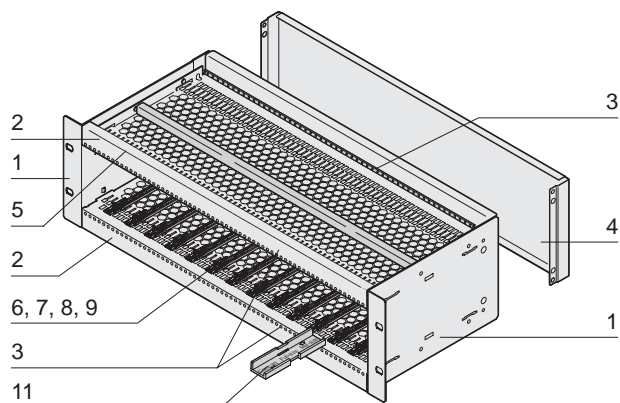
# NEW



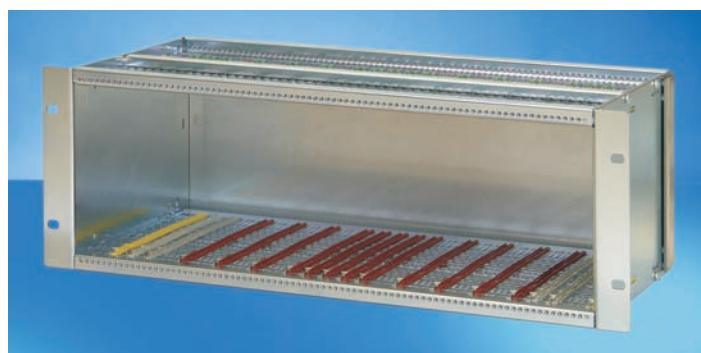
3 U

12806023

- In accordance with specifications
  - PICMG MicroTCA.0 R1.0 RC2
  - PICMG AMC.0 R2.0 RC1.2
  - PICMG AMC.0 RC1.1
- To accommodate compact, mid-size- and full-size AdvancedMC modules:
  - 3 U subrack for single modules
  - 4 U subrack for single and double modules with splitting kit
- Guide rails can be assembled in HP increments (5.08 mm) in top cover and base plate; ESD clips integrated in upper guide rails
- Top cover and base plate with reinforcement and front Al extrusion for threaded inserts



12807060



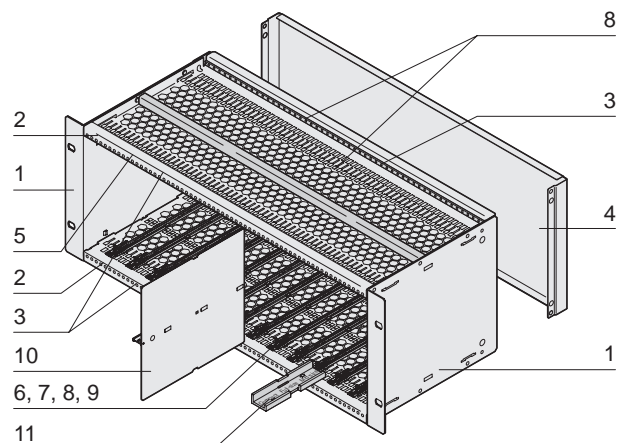
4 U

12806022

### Delivery comprises (kit)

Item	Qty	Description
1	2	Side panel with 19" bracket, St, 1.5 mm, zinc-plated, with EMC textile gasket on the right
2	2	Cover plate; for top and bottom, St, 1 mm, zinc-plated; with reinforcement and front Al extrusion to push in the threaded insert; with EMC textile gasket at top
3	4	Threaded insert M3, St, zinc-plated
4	1	EMC rear hood
5	20	Guide rail, green, top, PBT UL 94 V-0; with ESD clip, stainless steel, assembled in guide rail
6	20	Guide rail, red, bottom, PBT UL 94 V-0; for AdvancedMC function modules
7	2	Guide rail, yellow, bottom, PBT UL 94 V-0; for power supplies
8	2	Guide rail grey, bottom, PBT UL 94 V-0; for first slot position of a 6 HP wide MicroTCA carrier hub
9	2	Guide rail with back stop, grey, bottom, PBT UL 94 V-0, for third slot position of a 6 HP wide MicroTCA carrier hub
10	5	Splitting kit incl. guide rail, for assembly of single modules (only for 4 U subrack)
11	1	Mounting aid for guide rails

Items 5 ... 11 enclosed loose



12807061

### Order Information

Height U	Width HP	Depth mm	Qty/PU	Order no.
3	84	197	1	<b>20849-204</b>
4	84	197	1	<b>20849-205</b>
<b>Additional splitting kits PU 5 pieces</b>				<b>20849-115</b>
<b>MicroTCA backplane for subrack</b> 3 U, 2 + 2 + 12 slot, 1 piece				<b>23005-414</b>
<b>MicroTCA backplane for subrack</b> 4 U, 2 + 2 + 12 slot, 1 piece				<b>23005-415</b>

- Technical data of backplane see page 60
- Mounting rail for single backplane in double subrack see page 61
- Further guide rails see page 62
- CAD data: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)



ServicePLUS see page 82

## MicroTCA backplane for subracks

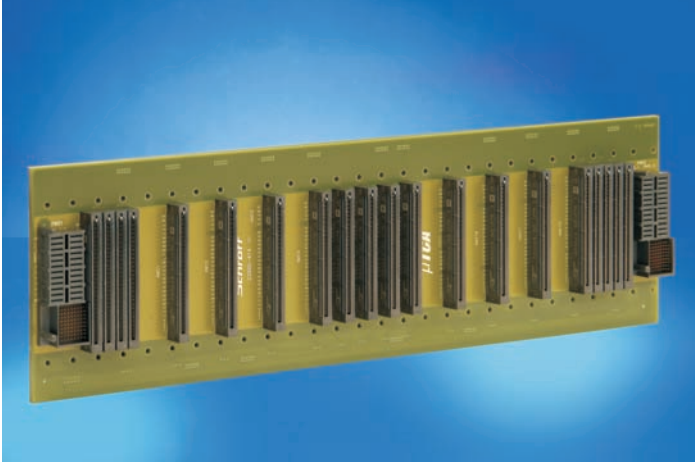


Illustration shows 3 U version

12606005

■ In accordance with PICMG MicroTCA.0 R1.0

# NEW

### Delivery comprises

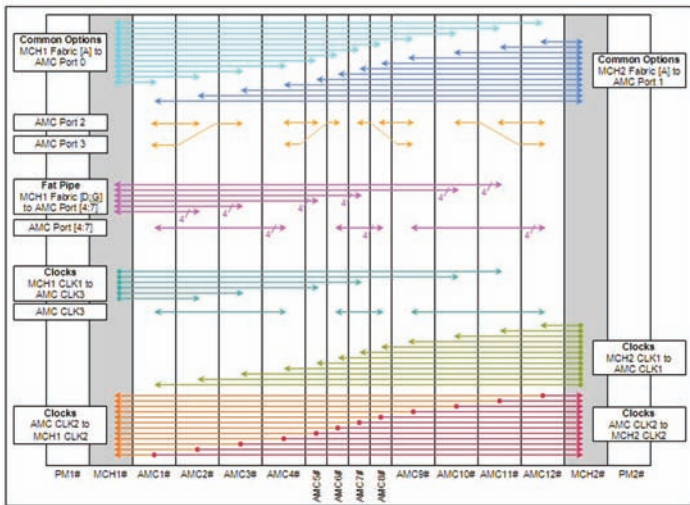
Item	Qty	Description
1	1	Backplane

### Order Information

Slots	AMC	Width mm	Height U	Description	Order no.
12		425.0	3	8 full-size slots, 4 single compact slots, 2 MCH slots, 2 PM slots	<b>23005-414</b>
12		425.0	4	8 full-size slots, 4 double compact slots, 2 MCH slots, 2 PM slots	<b>23005-415</b>

### Dimensions

	Backplane 2 + 2 + 12
Slots	12 AdvancedMC slots, 8 single full-size and 4 single compact, 2 redundant MicroTCA carrier hub (MCH) slots, 2 redundant power module (PM) slots 6 HP
IPMB	Radial IPMB connections from both MCH slots to all AdvancedMCs, bused redundant IPMB connections between both MCH and both PM slots
Clock Connections	CLK1: radial from MCH 2 to all AdvancedMC slots CLK2: radial from each AdvancedMC slot to both MCH slots, incl. serial termination CLK3: same topology as fat pipe connections (ports 4 ... 7)
Common options	AdvancedMC port 0 in star form to MCH1; AdvancedMC port 1 in star form to MCH2
Fat pipe	Ports 4 ... 7 radial connections from MCH1 to AdvancedMC slots 2, 3, 5, 7, 10, 11, point-to-point connections between slots 1 and 4, 6 and 8, 9 and 12



12907052

Topology



ServicePLUS see page 82

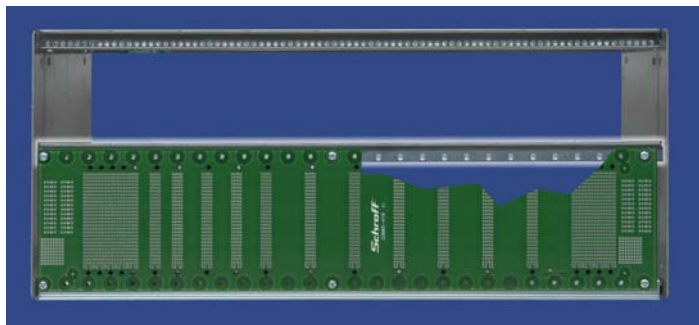
### Note

■ User manual: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)



For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.

## Mounting rail for single backplane in double subrack



12807009

- Is required when single backplanes are assembled in double subracks
- Mounting rail with M3 thread in 3 U increments
- Assembly by simply pushing into designated slots in side panel

# NEW

### Delivery comprises (Kit)

Item	Qty	Description
1	5	Mounting rail, St, 1.5 mm, zinc-plated, M3 thread in 3 HP increments

### Order Information

Description	Order no.
Mounting rail for single backplane in double subrack	<b>20849-206</b>

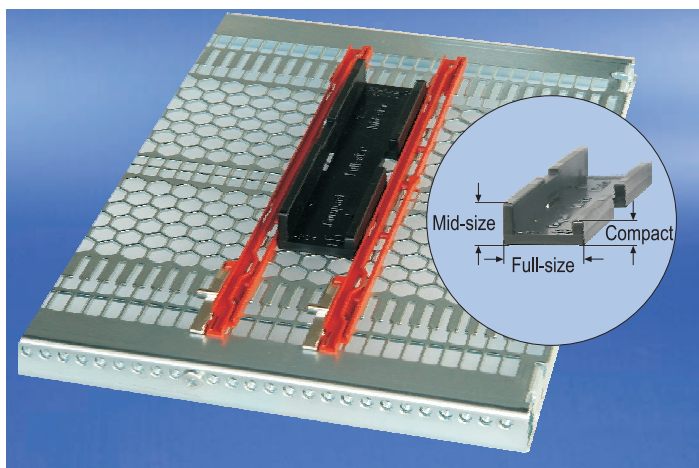
### Note

- CAD data: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)



For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.

## Mounting aid for guide rails



12807018

- Mounting aid usable for all AdvancedMC module sizes
  - Compact
  - Mid-size
  - Full-size

### Delivery comprises

Item	Qty	Description
1	1	Assembly aid, plastic, black

### Order Information

Description	Order no.
Mounting aid for guide rails	<b>20849-124</b>

### Note

- CAD data: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)



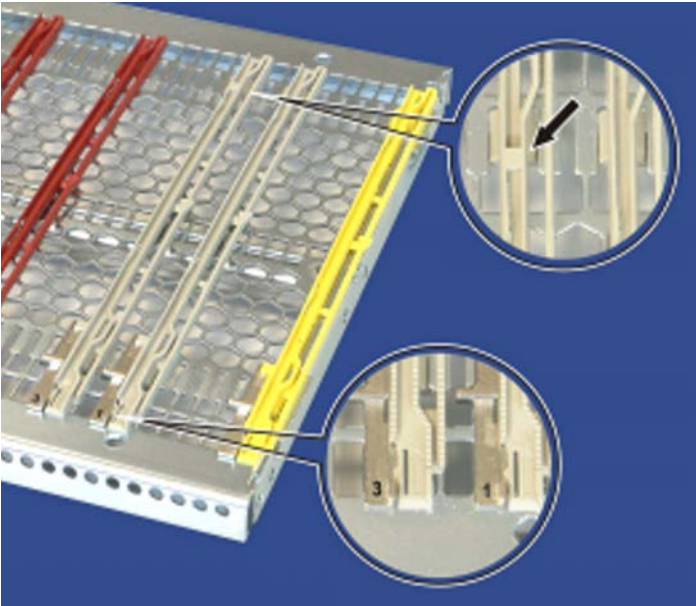
For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.

## MicroTCA guide rails



Upper guide rails (green), bottom guide rails (red)

12806010



Bottom guide rails, grey, for guide rails of 6 HP wide MicroTCA carrier hubs

12807011

- Assembly in 1 U increments on cover or base plate (minimum distance between two guide rails is 3 HP)
- Green guide rail, top, with ESD clip, for all modules
- Red guide rail, bottom, for AdvancedMC function modules
- Yellow guide rail, bottom, for power supplies
- Grey guide rail, bottom, for MicroTCA carrier hubs (MCHs)
  - First guide rail of a 6 HP MCH module (identification on guide rail: **1**)
  - Third guide rail of a 6 HP MCH module with back stop, so that MCHs are not inserted incorrectly (identification on guide rail: **3**)

### Order Information

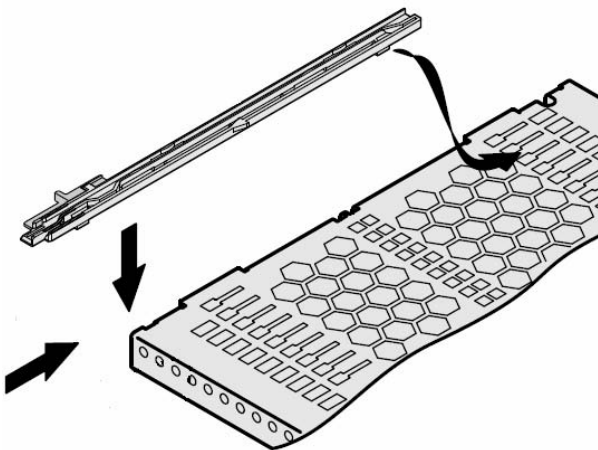
Description	Qty/PU	Order no.
Upper guide rail, green, with ESD clip	10	<b>20849-200</b>
Upper guide rail, green, with ESD clip	100	<b>20849-201</b>
Bottom guide rail, red, for AdvancedMC function modules	10	<b>20849-194</b>
Bottom guide rail, red, for AdvancedMC function modules	100	<b>20849-195</b>
Bottom guide rail, yellow, for power supplies	10	<b>20849-196</b>
Bottom guide rail, yellow, for power supplies	100	<b>20849-197</b>
Bottom guide rail, grey, for left guide rail of 6 HP wide MicroTCA carrier hubs (identification 3)	10	<b>20849-202</b>
Bottom guide rail, grey, for right hand guide rail of 6 HP wide MicroTCA carrier hubs (identification 1)	10	<b>20849-198</b>
Bottom guide rail, grey, for right hand guide rail of 6 HP wide MicroTCA carrier hubs (identification 1)	100	<b>20849-199</b>

### Note

- CAD data: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)



For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.



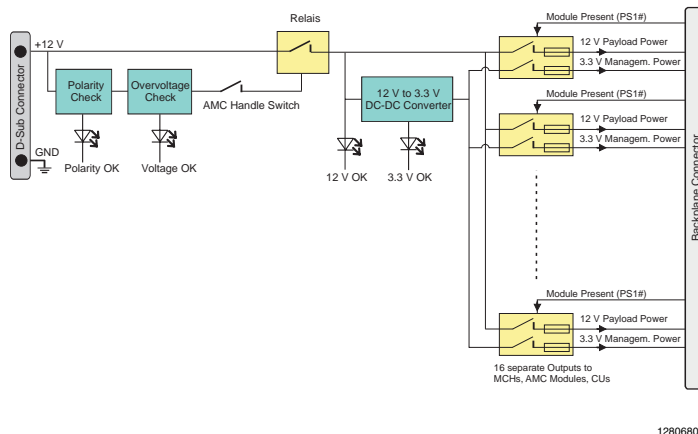
12807059

## MicroTCA power input module, single full-size



- Input of +12 V<sub>DC</sub> supply voltage from external source via D-Sub connector (front panel) to 16 x 12 V<sub>DC</sub> outputs of MicroTCA backplane
- Generation of +3.3 V<sub>DC</sub> management voltage, 5 A max. and distribution to 16 outputs
- Is inserted into the power module slot position instead of a MicroTCA power module (single full-size), connector and form factor compatible
- Hot-swap voltage cut-off of the individual outputs via "present" signal of AdvancedMC boards
- Protection against overvoltage and polarity reversal of input voltage

# NEW



### Order Information

Description	Order no.
MicroTCA power input module, single full-size	<b>23098-561</b>
<b>Connection cable</b> Power supply, 12 V <sub>DC</sub> output to power input module, length 260 mm, 1 piece	<b>23204-176</b>
<b>Connection cable</b> Power supply 12 V <sub>DC</sub> output to power input module, length 550 mm, 1 piece	<b>23204-182</b>
<b>Connection cable</b> from power supply module (-12 V <sub>DC</sub> ) to ring cable eye M5, length 2 m, 1 pce	<b>23204-802</b>

### Note

- Both connecting cables are specifically for use in developing systems
- User manual: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)



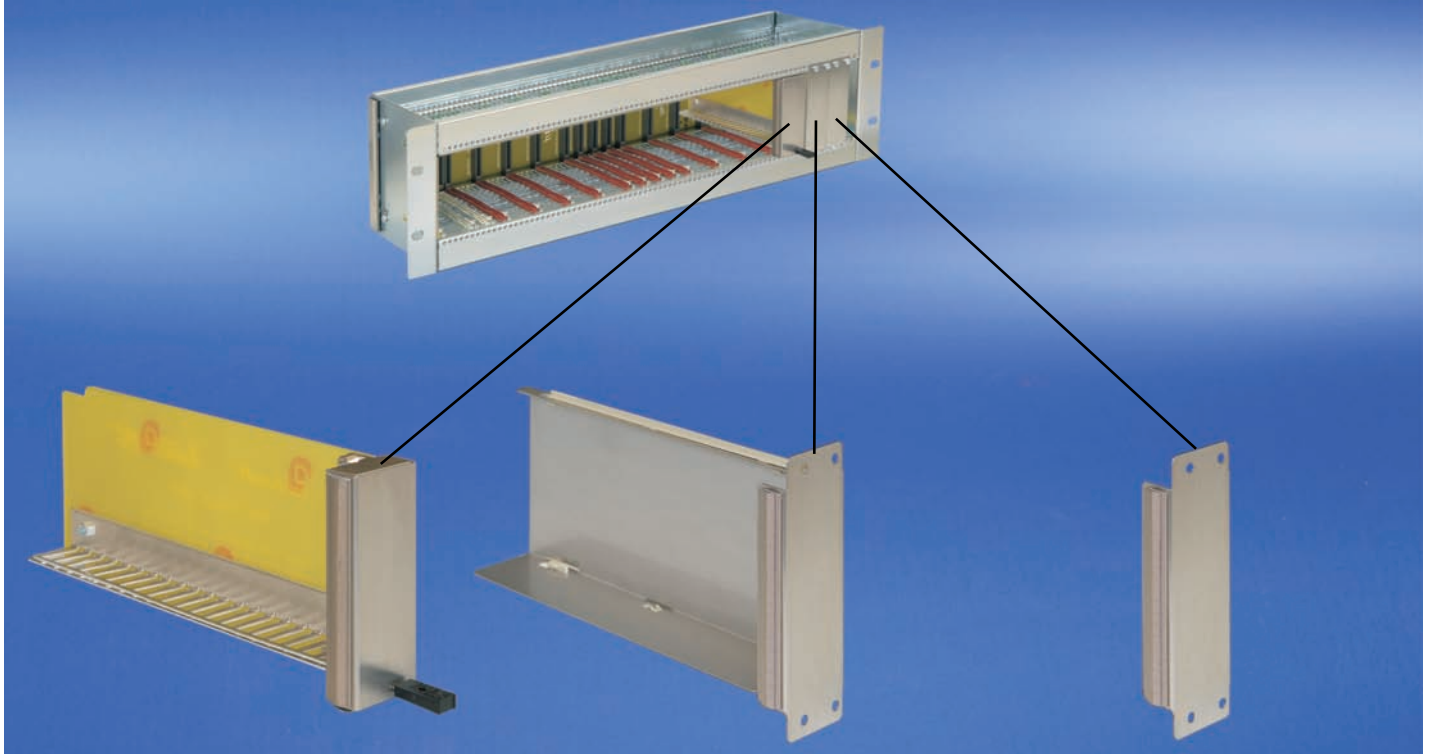
ServicePLUS see page 82



For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.

**MicroTCA filler modules**

MicroTCA subracks and systems must always be shielded in accordance with the standard. Therefore, all slots, even if unused, must be covered. Schroff offers three possibilities to cover the front EMC-compliantly.



12907008

**AdvancedMC filler panel for adjustable air throughput**

- Insertion/extraction mechanism conforms to AdvancedMC Specification; inserted into guide rails
- Optional air-circulation baffle allows adjustment of air throughput from 60 ... 80 %
- Same design as AdvancedMC modules
- Description see page 72

**MicroTCA filler panel with fixed air baffle**

- Can be screwed on; inserted into guide rails
- With air baffle
- Description see page 65

**Front panel**

- Can be screwed on
- Without air baffle
- Description see page 65



### MicroTCA filler modules with air baffle



Single full-size

12807013



ServicePLUS see page 82

- Must be pushed into guide rails; can be screwed on
- With air baffle

#### Delivery comprises (assembled)

Item	Qty	Description
1	1	Front panel with side panel and air baffle, stainless steel, 0.6 mm
2	1	Lateral EMC profile gasketing, core: foam, sleeve: textile cladding with CuNi coating
3	2	Guide rail, PBT, UL 94 V-0, grey
4	1	Assembly kit

#### Order Information

Description	Order no.
MicroTCA filler module single compact	<b>20849-187</b>
MicroTCA filler module single mid-size	<b>20849-186</b>
MicroTCA filler module single full-size	<b>20849-185</b>
MicroTCA filler module double compact	<b>20849-184</b>
MicroTCA filler module double full-size	<b>20849-183</b>
MicroTCA filler module double full-size	<b>20849-182</b>

#### Note

- Not suitable with splitting kit
- CAD data: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)

### MicroTCA front panel



Single mid-size

12807014



ServicePLUS see page 82

- Must be screwed on

#### Delivery comprises (assembled)

Item	Qty	Description
1	1	Front panel, stainless steel, 0.6 mm
2	1	Lateral EMC profile gasketing, core: foam, sleeve: textile cladding with CuNi coating
3	1	Assembly kit

#### Order Information

Description	Qty/PU	Order no.
MicroTCA filler module single, 2 HP	5	<b>20849-213</b>
MicroTCA filler module single, 3 HP	5	<b>20849-215</b>
MicroTCA filler module single, 4 HP	5	<b>20849-217</b>
MicroTCA filler module single, 6 HP	5	<b>20849-219</b>
MicroTCA filler module double, 2 HP	5	<b>20849-214</b>
MicroTCA filler module double, 3 HP	5	<b>20849-216</b>
MicroTCA filler module double, 4 HP	5	<b>20849-218</b>
MicroTCA filler module double, 6 HP	5	<b>20849-220</b>

#### Note

- Not suitable with splitting kit
- CAD data: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)

## Field replaceable units (FRUs)

Field replaceable units (FRUs) designate system components that can be exchanged on-site, thus reducing the downtime of systems to a minimum.

Schroff offers various FRU components for MicroTCA systems:

- Air-cooling units
- Air filter

## Fan units for 6 and 8 U development systems



12907012

- Plug-in fan unit with 3 axial fans (170 m<sup>3</sup>/h each), 12 V<sub>DC</sub>, temperature controllable with NTC
- Air circulation upwards from the front

### Order Information

Description	Description	Qty/PU	Order no.
Air-cooling units	for development systems (11850-005, 11850-007)	1	<b>21850-035</b>

### Note

- User manual: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)



For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.

## Frame-type fan plug-in units for 3 U systems, without Telco alarm panel



12907013

- Fan tray with 1 axial fan (225 m<sup>3</sup>/h), 12 V<sub>DC</sub>
- With cooling unit enhanced module management controller (CU EMMC)

### Order Information

Description	Description	Qty/PU	Order no.
Air-cooling units	for 3 U MicroTCA system (11850-003)	1	<b>21850-038</b>

### Note

- User manual: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)



For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.

### Frame-type fan plug-in units for 6 U systems, without Telco alarm panel



12907006

- Fan tray with 2 axial fans (each 460 m<sup>3</sup>/h), 12 V<sub>DC</sub>
- With cooling unit enhanced module management controller (CU EMMC)

#### Order Information

Description	Description	Qty/PU	Order no.
Air-cooling units	for 6 U MicroTCA system (10849-005)	1	<b>21850-036</b>

#### Note

- User manual: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)

### Frame-type fan plug-in units for 6 U system with Telco alarm panel



12907007

- Fan tray with 2 axial fans (each 460 m<sup>3</sup>/h), 12 V<sub>DC</sub>
- With cooling unit enhanced module management controller (CU EMMC)
- With Telco alarm interface, includes 3 LEDs, a Telco alarm connector (DB15) and a Telco alarm silence push-button

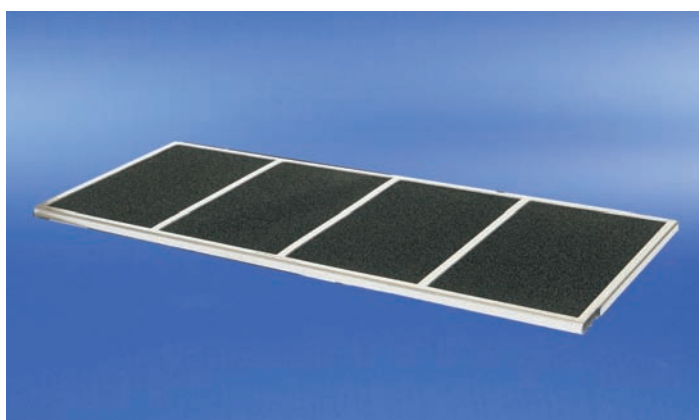
#### Order Information

Description	Description	Qty/PU	Order no.
Air-cooling units	for 6 U MicroTCA system (10849-005)	1	<b>21850-037</b>

#### Note

- User manual: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)

### Air filter



12907005

- Material: polyurethane UL 94 HF1
- 45 ppi, 80 % dust reduction under NEBS GR-78 core standard

#### Order Information

Description	Description	Qty/PU	Order no.
Air filter	for 3 U MicroTCA system (11850-003)	1	<b>21850-034</b>
Air filter	for development systems and 6 U MicroTCA systems (10849-005, 11850-005, 11850-007)	1	<b>21850-033</b>

#### Note

- CAD data: Please enter order number under [www.schroff.biz/oneclick/](http://www.schroff.biz/oneclick/)

# AdvancedMC™-Module

Overview ..... 2

- AdvancedTCA ..... 4
- MicroTCA ..... 6
- AdvancedMC ..... 8
- Applications ..... 10
- Systems ..... 12
- Chassis ..... 13
- Backplanes ..... 14
- Shelf manager ..... 15
- Cooling designs ..... 16

AdvancedTCA ..... 18

AdvancedMC carriers ..... 42

MicroTCA ..... 52

AdvancedMC modules ..... 68

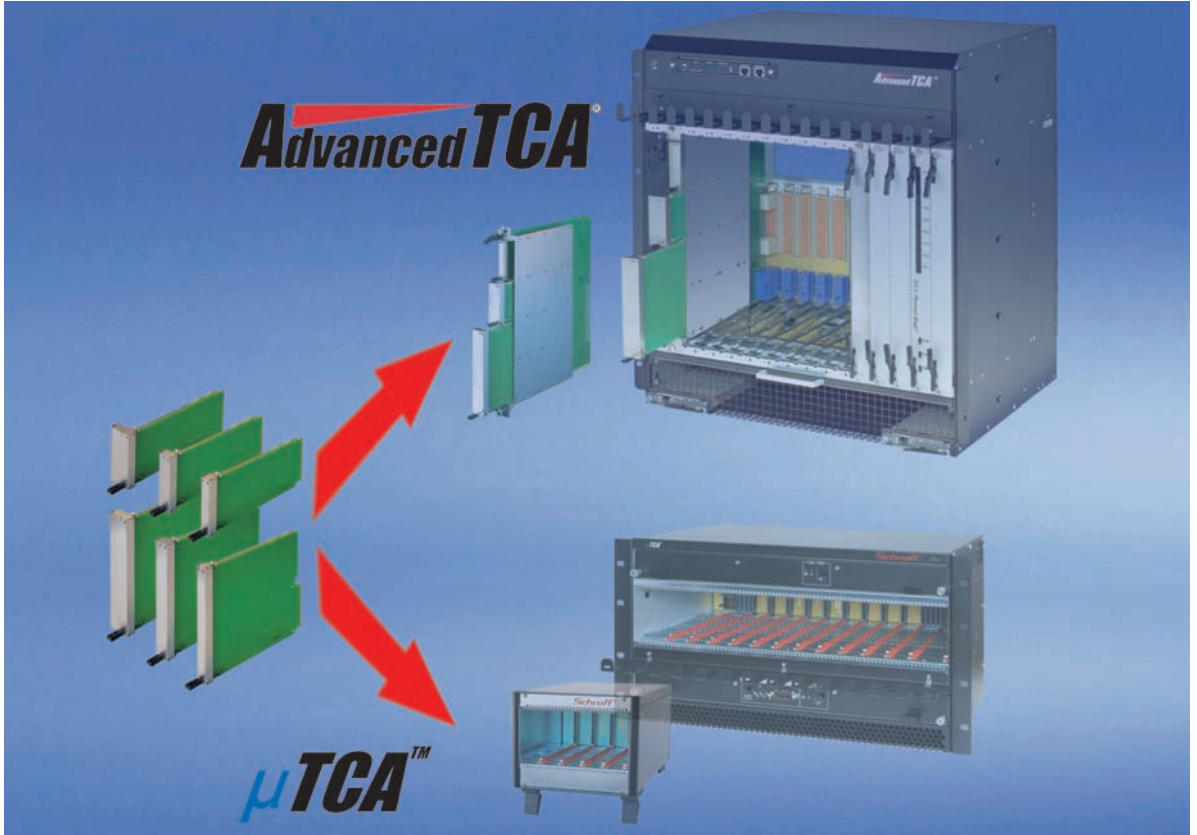
VARISTAR LHX 20 with air/water-heat exchanger... 74

Internet [www.a-tca.com](http://www.a-tca.com) .. 80

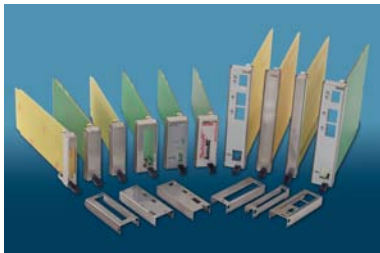
ServicePLUS ..... 82

Standards

- AdvancedTCA ..... 84
- MicroTCA ..... 86



12806029



12806024

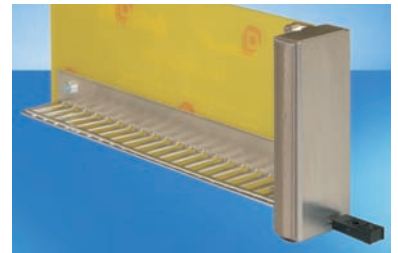
AdvancedMC modules adapted to your specifications

- Cut-outs
- Finish
- Printing
- Assembly



12805005

Handle with interlocking mechanism



12807012

Filler module with air baffle (air throughput 60 ... 80 %)

## AdvancedMC modules mechanics

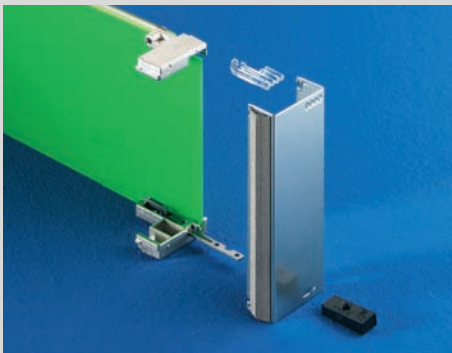
- Front panel with interlocking mechanism for AdvancedMC carriers and MicroTCA systems
- AdvancedMC module dimensions
  - 2 heights (single and double)
  - 3 widths (compact, mid-size and full-size)
- Filler modules with adjustable air inlet
- Standard versions from stock
- Cut-outs, printing, finish and assembly to your specifications



Overview . . . .68.

### AdvancedMC modules

AdvancedMC module mechanics PICMG® AMC.0 RC1.1 . . . .70  
 AdvancedMC module mechanics PICMG AMC.0 R2.0 RC1.2 . . . . .71  
 AdvancedMC filler modules (filler panel) . . . . .72  
 Air baffle for AdvancedMC filler modules . . . . .72  
 Micro switch . . . . .73



12805006

### AdvancedMC module mechanics

- Front panel with handle, EMC shielded
- Module interlocking without screws
- Designed for insertion/extraction mechanism conforming to AdvancedMC Standard for microswitch activation
- For PICMG® AMC.0 RC1.1 and AMC.0 R2.0 RC1.2
- Optional microswitch
- Includes light pipe for standard LEDs



12807012

### AdvancedMC filler modules

- Front panel with handle, printed board and air baffle for compact, mid-size and full-size AdvancedMC modules
- Air baffles to adjust air resistance where a slot is not used
- Air throughput adjustable 60 ... 80 %



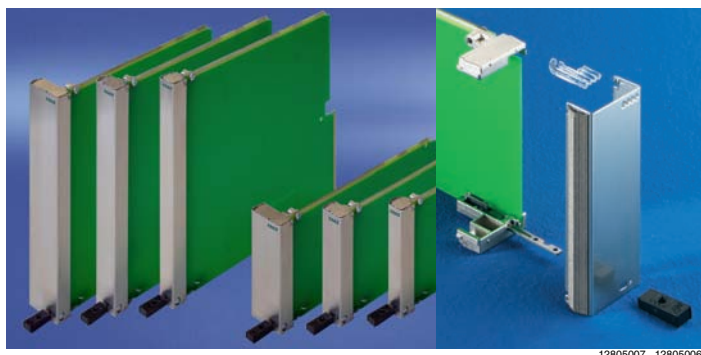
30407004

[www.schroff.biz/serviceplus/](http://www.schroff.biz/serviceplus/)

### ServicePLUS (more details see page 82)

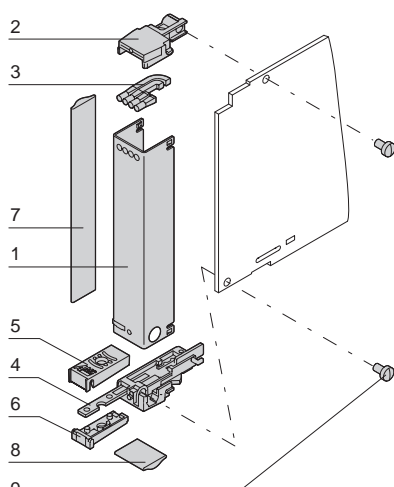
- assembly: Assembled by professionals. Double benefit!
- modification: Small changes. Large impact.
- solution: Simple. Everything. From one source.
- express: When fast has to be faster.

## AdvancedMC module mechanics PIGM® AMC.0 RC1.1



12805007 12805006

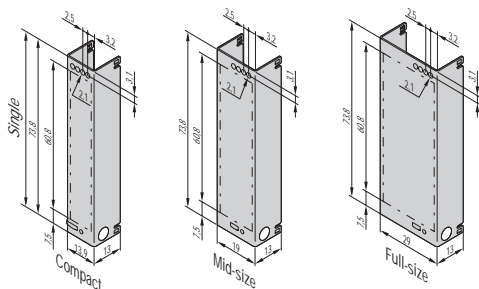
- Kit, shielded
- Interlocking of modules without screws
- For conventional, cutaway and hybrid carrier
- Insertion/extraction mechanics in accordance with AdvancedMC Standard
- Insertion/extraction mechanics designed for microswitch operation hot-swap)
- Inclusive of light pipe



### Delivery comprises (kit)

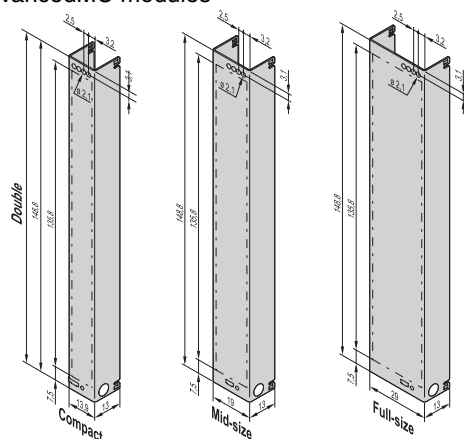
Item	Qty	Description
1	1	U-form front panel, stainless steel, 0.6 mm
2	1	Holder for light pipe and board bracket, Zn die-cast, nickel-plated
3	1	Light Pipe, PC, UL 94 V-0
4	1	Standard insertion/extraction mechanics, with microswitch operation and board bracket
5+6	1	Handle, PC, UL 94 V-0, black
7	1	Lateral EMC gasketing, core: foam, sleeve: textile cladding with CuNi-coating
8	1	EMC gasketing at bottom, core: foam, sleeve: textile cladding with CuNi-coating
9	1	Assembly kit

### Single AdvancedMC modules



12805061

### Double AdvancedMC modules



12805080

### Order Information

Description	Order no.
AdvancedMC module mechanics single compact, 3 HP	<b>20849-002</b>
AdvancedMC module mechanics single mid-size, 4 HP	<b>20849-101</b>
AdvancedMC module mechanics single full-size, 6 HP	<b>20849-004</b>
AdvancedMC module mechanics double compact, 3 HP	<b>20849-003</b>
AdvancedMC module mechanics double mid-size, 4 HP	<b>20849-104</b>
AdvancedMC module mechanics double full-size, 6 HP	<b>20849-005</b>
<b>Microswitch for AdvancedMC modules</b> for soldering (SMD), PU 10 pieces	<b>20849-209</b>

### Note

- Filler modules (filler panels) see page 72
- Description microswitch for AdvancedMC modules see page 73
- Schroff offers an extensive modification service via the Front Panel Service, including customized cut-outs, foils and silk-screen printing, [www.schroff.biz/fpe](http://www.schroff.biz/fpe)

## FRONT PANEL FAST TRACK



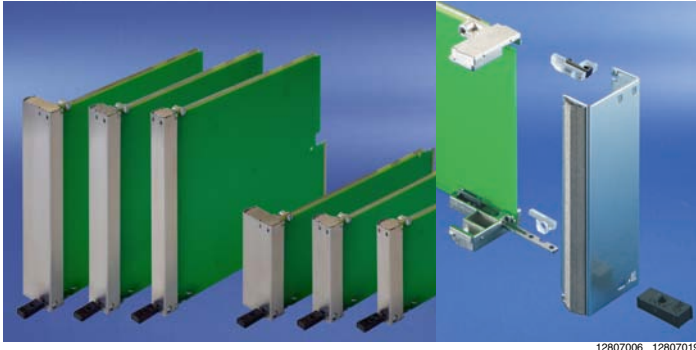
For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.

12806050



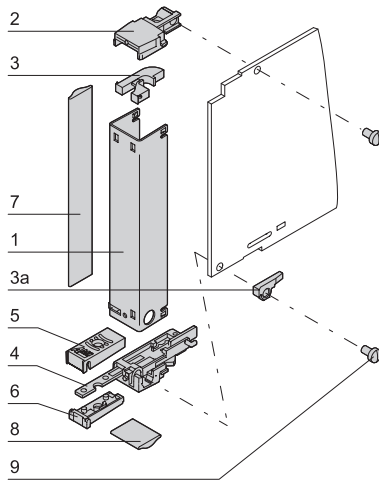
ServicePLUS see page 82

## AdvancedMC module mechanics PICMG® AMC.0 R2.0 RC1.2



- Kit, shielded
- Interlocking of modules without screws
- For conventional, cutaway and hybrid carrier
- Insertion/extraction mechanics in accordance with AdvancedMC Specification
- Insertion/extraction mechanics designed for microswitch operation (hot-swap)
- Inclusive of light pipes

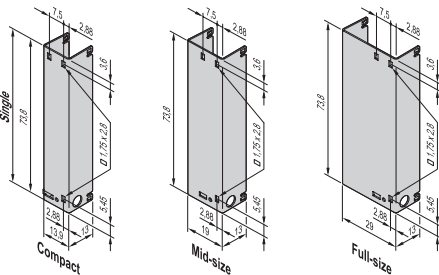
# NEW



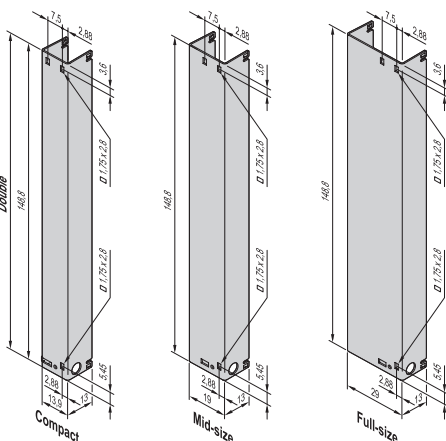
### Delivery comprises ((kit))

Item	Qty	Description
1	1	U-form front panel, stainless steel, 0.6 mm
2	1	Holder for light pipe at top and board bracket, Zn die-cast, nickel-plated
3	1	Upper light pipe, PC, UL 94 V-0
3a	1	Bottom light pipe, PC, UL 94 V-0
4	1	Standard insertion/extraction mechanics, with microswitch operation and board bracket
5 + 6	1	Handle, PC, UL 94 V-0, black
7	1	Lateral EMC gasketing, core: foam, sleeve: textile cladding with CuNi-coating
8	1	Bottom EMC gasketing, core: foam, sleeve: textile cladding with CuNi-coating
9	1	Assembly kit

### Single AdvancedMC modules



### Double AdvancedMC modules



### Order Information

Description	Order no.
AdvancedMC module mechanics single compact, 3 HP	<b>20849-127</b>
AdvancedMC module mechanics single mid-size, 4 HP	<b>20849-128</b>
AdvancedMC module mechanics single full-size, 6 HP	<b>20849-129</b>
AdvancedMC module mechanics double compact, 3 HP	<b>20849-130</b>
AdvancedMC module mechanics double mid-size, 4 HP	<b>20849-131</b>
AdvancedMC module mechanics double full-size, 6 HP	<b>20849-132</b>
<b>Microswitch for AdvancedMC modules normally open, for soldering (SMD), PU 10 pieces</b>	<b>20849-209</b>

### Note

- Filler modules (filler panels) see page 72
- Microswitch for AdvancedMC modules see page 73
- Schroff offers an extensive modification service via the Front Panel Service, including customized cut-outs, foils and silk-screen printing, [www.schroff.biz/fpe](http://www.schroff.biz/fpe)

## FRONT PANEL FAST TRACK



For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.



ServicePLUS see page 82



Filler module single, full-size with air baffle

12807012

## AdvancedMC filler modules (filler panels)

- For conventional, cutaway and hybrid carrier
- Insertion/extraction mechanism in accordance with AdvancedMC Specification; is pushed into guide rails
- Same design as AdvancedMC modules
- By using an air baffle the air through-put can be adjusted from 60 ... 80 % (please order separately)

### Delivery comprises (assembled)

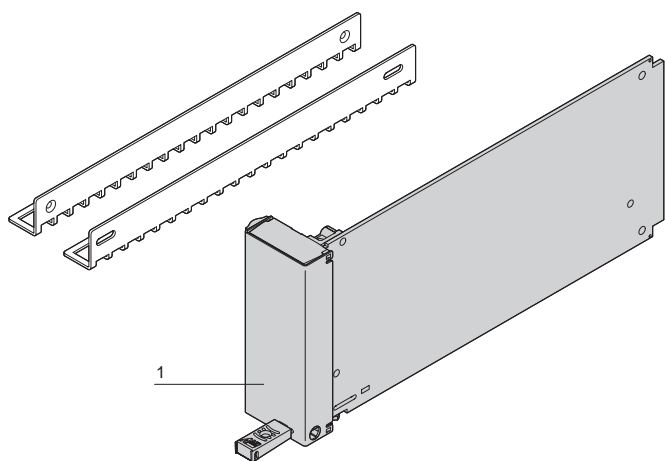
Item	Qty	Description
1	1	<b>AdvancedMC filler module, consisting of</b>
	1	U-form front panel, stainless steel, 0.6 mm
	1	Printed board bracket, Zn die-cast, nickel-plated
	1	Printed circuit board
	1	Insertion/extraction mechanics and board bracket
	1	Handle, plastic, PC, UL 94 V-0, black
	1	Lateral EMC profile gasketing, core: foam, sleeve: textile cladding with CuNi-coating
	1	Bottom EMC profile gasketing, core: foam, sleeve: textile cladding with CuNi-coating

### Order Information

Description	Order no.
AdvancedMC filler module single compact	<b>20849-022</b>
AdvancedMC filler module single mid-size	<b>20849-106</b>
AdvancedMC filler module single full-size	<b>20849-024</b>
AdvancedMC filler module double compact	<b>20849-023</b>
AdvancedMC filler module double mid-size	<b>20849-107</b>
AdvancedMC filler module double full-size	<b>20849-025</b>

### Note

- Front panel dimensions see page 70
- Please order air baffle separately, see page 72



12805050



ServicePLUS see page 82

## Air baffle for AdvancedMC filler modules

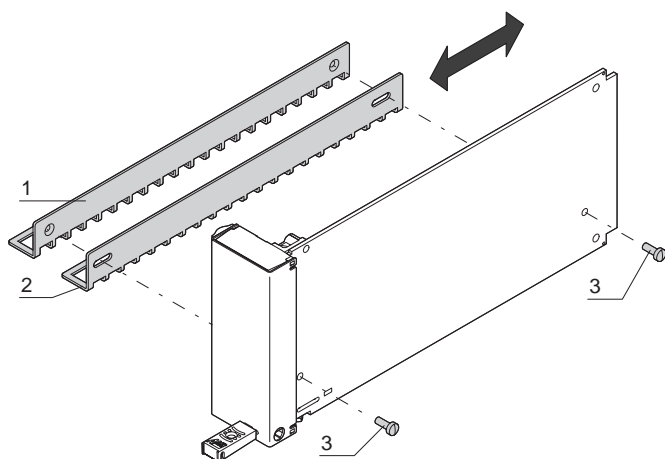
- Air throughput adjustable between 60 ... 80 %
- Retrofittable

### Delivery comprises

Item	Qty	Description
1	1	Metal sheet with perforation, Al
2	1	Sliding metal sheet with perforation, Al
3	1	Assembly kit

### Order Information

Description	Qty/PU	Order no.
Air baffle for AdvancedMC filler module compact	10	<b>20849-016</b>
Air baffle for AdvancedMC filler module mid-size and full-size	10	<b>20849-017</b>
Air baffle for AdvancedMC filler module full-size, cutaway printed boards	10	<b>20849-018</b>



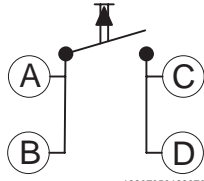
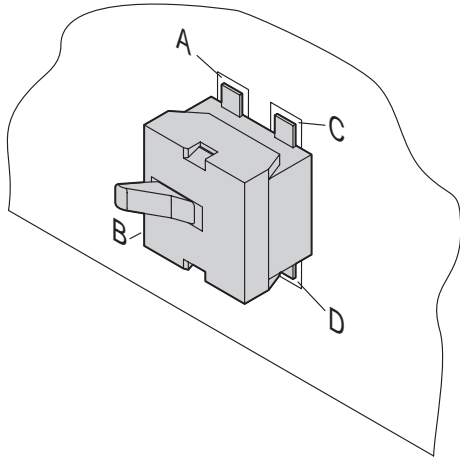
12805051



ServicePLUS see page 82



## Microswitch for AdvancedMC modules



12807050/12807078

- Microswitch for soldering (SMD)

### Order Information

Description	Qty/PU	Order no.
Microswitch for AdvancedMC module	10	<b>20849-209</b>

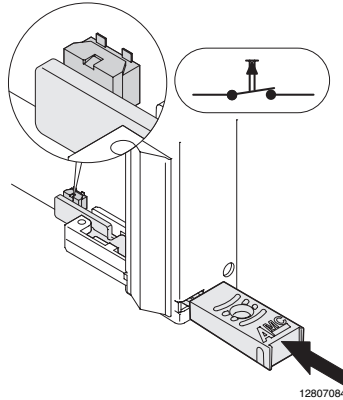
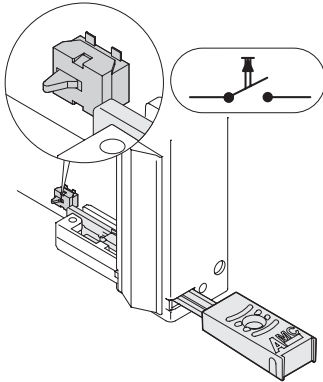
### Dimensions

Max. switch current	1 mA, 5 V <sub>DC</sub>
Operating temperature	-15 °C ... +70 °C
Electrical lifespan	10 <sup>5</sup>



For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.

"normally open"



12807084

# VARISTAR LHX 20 with air/water heat exchanger

Overview ..... 2

- AdvancedTCA ..... 4
- MicroTCA ..... 6
- AdvancedMC ..... 8
- Applications ..... 10
- Systems ..... 12
- Chassis ..... 13
- Backplanes ..... 14
- Shelf manager .... 15
- Cooling designs.... 16

AdvancedTCA..... 18

AdvancedMC carriers ..... 42

MicroTCA ..... 52

AdvancedMC modules ..... 68

VARISTAR LHX 20 with air/water-heat exchanger... 74

Internet [www.a-tca.com](http://www.a-tca.com) .. 80

ServicePLUS ..... 82

Standards

- AdvancedTCA ..... 84
- MicroTCA ..... 86



01007021

The compact construction of AdvancedTCA and MicroTCA systems and the immense performance of the AdvancedMC modules place high demands on the cooling system.

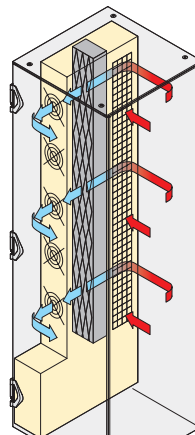
The heat loss of an AdvancedTCA system can exceed 3 kW and that of a MicroTCA system can be up to 1 kW. Multiple systems may be fitted within one cabinet. For this situation we offer a complete cabinet design with integrated air/water heat exchanger.



01005009

### Protection between electronics and water

For safety reasons the air/water heat exchanger is contained within its own protective housing. This ensures that no water comes into contact with the electronics. The water supply is from the bottom.



01005081

### Principle of operation

The warm air is sucked from the rear and drawn through the air/water heat exchanger. In the exchanger the heat is transferred to the water. The cooled air is returned to the electronics systems from the front via powerful temperature-controlled fans.



01005081

### Control and adjustment

Electronic monitoring unit with display and interfaces for communication with the AdvancedTCA shelf manager. Interfaces for cabinet monitoring and optional Ethernet gateway.

# VARISTAR LHX 20 with air/water heat exchanger

## Effective cooling with air/water heat exchanger

- A well thought-out mechanical solution avoids direct contact between electronics and water
- The water dissipates the heat without warming the cabinet's surroundings
- Optimal system adjustment and safety via built-in alarm and communications interfaces
- Individual parametrisation results in low energy consumption

Overview . . . .74

VARISTAR  
LHX 20 . . . . .76



01105019

### VARISTAR LHX 20 for AdvancedTCA applications

- Cooling capacity of up to 20 kW
- Air flow capacity 1000 ... 3000 m<sup>3</sup>/h, temperature controlled
- Air discharge temperature adjustable in range from 18 to 30 °C
- Condensation control with built-in drop collector
- Uniform air dissipation over whole cabinet height
- Temperature regulation through water and air circuit
- Low noise level of 50 dB(A)

### Special solutions available on request

- Mounting of heat exchanger on right hand side
- Other cabinet dimensions (e. g. 1200 mm depth)
- Side-by-side mounting solutions
- Other cooling capacities
- Electronic door opening
- Special colours

### ServicePLUS (more details see page 82)

- Configuration: Simple. Fast to the ideal product.
- assembly: Assembled by professionals. Double benefit!
- modification: Small changes. Large impact.
- solution: Simple. Fast. From one source.
- support: Support. Solution. Availability.
- academy: Knowledge. Sharing. Partnerships.
- life cycle: Bespoke service. For the entire life of the product.



30407004

[www.schroff.biz/serviceplus/](http://www.schroff.biz/serviceplus/)

# VARISTAR LHX 20 with air/water heat exchanger

## VARISTAR LHX 20 for Advanced TCA

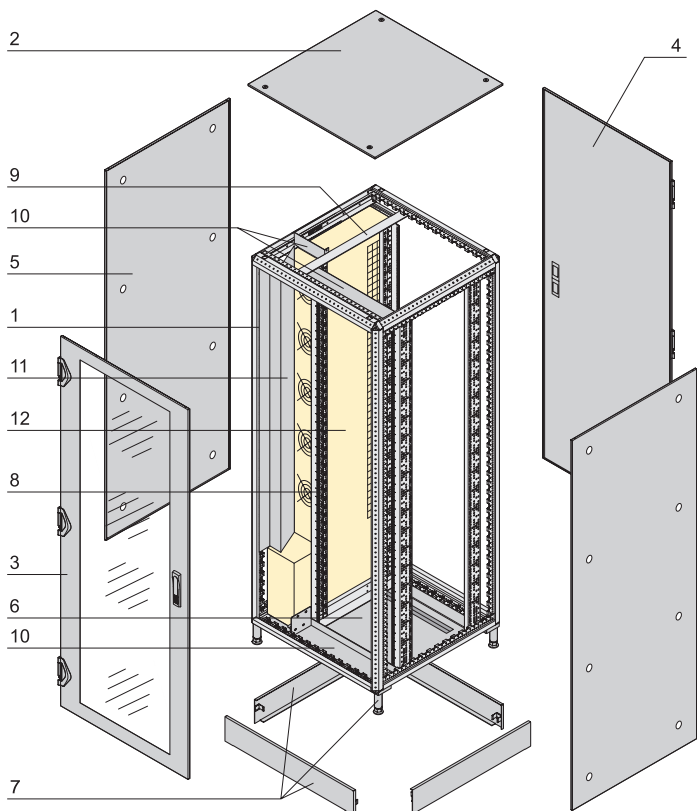


01005019

- Cabinet IP 55, RAL 7021 with air/water heat exchanger
- Assembly dimensions in alignment with those of AdvancedTCA subracks (cabinet depth 800 mm)
- Air/water heat exchanger 20 kW, voltage supply 48 V<sub>DC</sub> or 230 V<sub>AC</sub>, assembled on the left (assembly on the right possible)
- Max. static load-carrying of 19" plane: 800 kg

### Delivery comprises (completely assembled and GND/earthed)

item	Qty	Description
1	1	Welded basic frame, St profile, zinc-plated, RAL 7021, IP 55 with sealing all around
2	1	Flat top cover, St, RAL 7021
3	1	Front door glazed, RAL 7021, security glass 6 mm, 180° hinge, 4 point locking, lever handle for optional DIN profile half cylinder
4	1	Rear door, St, RAL 7021, 180° hinge, 4 point locking, lever handle for optional DIN profile half cylinder
5	2	Side panel, screw-fixed, St, RAL 7021
6	1	Base plate, St, RAL 7021, cable ducting at rear, water connection at front, connections can be sealed with sliding covers
7	1	Base/plinth 100 mm, St, RAL 7021, removable trims, integrated feet
8	4	19" panel/slide mount with EIA cut-outs, St, RAL 7021, 175 mm recessed at front, 500 mm distance between front and rear 19" plane
9	2	Support rail for assembly of air/water heat exchanger and 19" panel/slide mounts, St, RAL 7021
10	4	Air baffle, St, RAL 7021
11	1	Air baffle for optimised airflow, St, RAL 7021
12	1	Air/water heat exchanger 20 kW, RAL 7021 V <sub>AC</sub> , assembled on the left (assembly on the right possible)
13	1	User manual



01005091

### Order Information

Height U	Height H mm	Width W mm	Depth D mm	Description	Order no.
42	2100	800	800	230 V <sub>AC</sub>	<b>10130-010</b>
42	2100	800	800	48 V <sub>DC</sub>	<b>10130-011</b>
<b>DIN profile half cylinder, common locking</b> (1 key fits into all locks), incl. 2 keys					<b>25127-995</b>
<b>Lifting eye PU 4 pieces</b>					<b>23130-072</b>
<b>Ethernet gateway for LHX 20 1 piece</b>					<b>60130-440</b>

### Note

- Total weight 266 kg
- Further dimensions and versions available on request
- Technical data air/water heat exchanger see page 77
- For a description of the Ethernet gateway see page 78



For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.

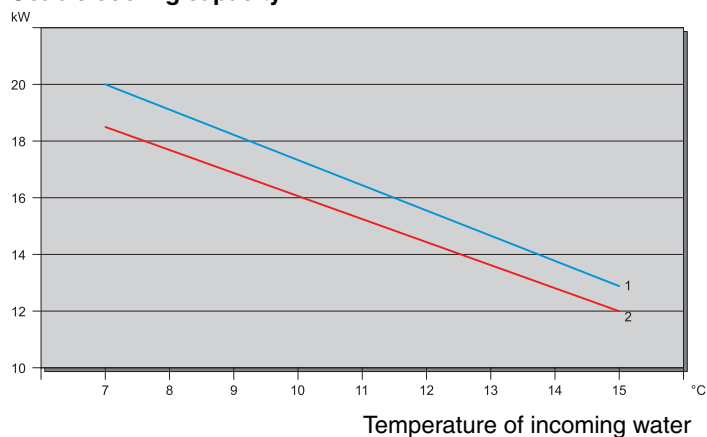


ServicePLUS see page 82

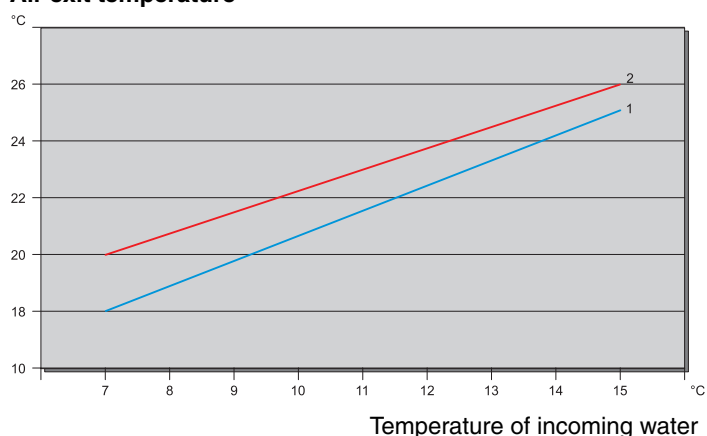
# VARISTAR LHX 20 with air/water heat exchanger

## Technical data LHX20 (only air/water heat exchanger)

### Usable cooling capacity<sup>\*)</sup>



### Air exit temperature<sup>\*)</sup>



<sup>\*)</sup> at constant incoming air temperature of 40 °C

1) at 2.8 m<sup>3</sup>/h water

2) at 1.55 m<sup>3</sup>/h water

### Dimensions LHX 20

Cooling capacity	
Usable cooling capacity	up to 20 KW
Adjustment range air outlet temperature	18 ... 30 °C (in 0.1 °C increments)
Max. offset	± 2 K
Water circuit	
Cooling medium <sup>1)</sup>	Water
Water inlet temperature <sup>2)</sup>	6 ... 15 °C
Water flow volume	up to 2.8 m <sup>3</sup> /h
Static pressure loss in device at 1.55 m <sup>3</sup> /h	0.5 bar
Water conduit	Copper
Water connection inlet/outlet	Rp 1"
Condensat drain connection	Rp 1/2"
Air circuit	
Airflow volume, temperature dependently controlled	1000 .... 3000 m <sup>3</sup> /h
Air outlet LHX 20 (adjustable)	18 .... 30° C
Electrical data AC	
Supply voltage (single phase mains/line)	230 V <sub>AC</sub> (50/60 Hz)
Max. current consumption	4.3 A
Max. power consumption	700 W
Apparent output at full load	990 VA
Pre-fuse	10 A
Electrical data DC	
Supply voltage	48 V <sub>DC</sub>
Max. current consumption	13 A
Max. power consumption	624 W
Pre-fuse	16 A
Interface	
ST bus (RJ 45)	Connection possibility for external operation and digital display
RS 232 (SUB D 9-pin)	ASCII protocol, all operational values and status reports, such as temperature, humidity levels, fan operation times
Digital input/output (SUB-D 25-pin)	External on/off, alarm outputs and warning signals
General Data	
Type of protection cabinet	IP 55
Ambient temperature at transport	-25 ... 70 °C
Ambient temperature outside of cabinet (during operation)	5 ... 70 °C
Noise level (closed cabinet) at 80 % fan capacity	50.7 dB(A)
Relative humidity level	5 ... 95 %
Weight	78.5 kg (82 kg with water)

1) For an optimal operation of the air/water heat exchanger the demands on water quality have to be fulfilled (VDE 3803, please see user manual)

2) For water inlet temperature < 6 °C and > 15 °C the control accuracy is not guaranteed anymore, furthermore there is the risk of condensation if the water temperature falls short of limits

# VARISTAR LHX 20 with air/water heat exchanger

## Ethernet gateway for LHX 20



01007022

- Network connection for VARISTAR air/water heat exchanger LHX 20
  - Ethernet 10/100 MHz
  - RS 485
  - RS 232
- StackSNMPv3 protocol

### Delivery comprises (assembled)

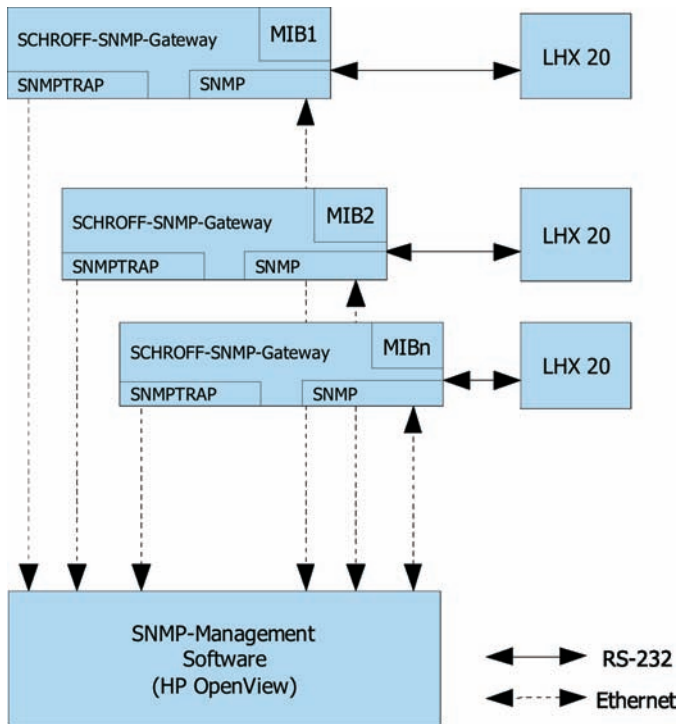
Item	Qty	Description
1	1	Interface in small case, height 46 mm, width 158 mm, depth 100 mm, RAL 7021; mains/line voltage 230 V <sub>AC</sub> ; 3-pin mains/line connectors for Wieland connector type ST 18/3; ST bus RS485, 3-pin screw connection; ST bus COM1 RS232, SUB-D 9-pin female connector; Ethernet RJ45, 8-pin, CAT5
2	1	Equipment cable SCHUKO/UTE connector, cable length 2 m, Wieland type ST18/3
3	2	Mounting bracket
4	1	User manual

### Order Information

Description	Order no.
Ethernet gateway for LHX 20	<b>60130-440</b>
Item 5, mounting plate for Ethernet gateway (LHX 20), for mounting on 19" profile, incl. assembly kit, 1 kit	<b>23130-389</b>

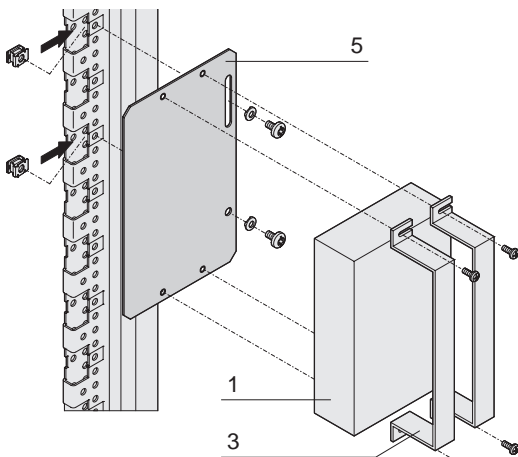


For further information [www.schroff.biz/oneclick](http://www.schroff.biz/oneclick)  
oneClick code = Order no.



01007077

SNMP management



01007078

Mounting plate (item 5) with Ethernet gateway (item 1) and mounting bracket (item 3)

# VARISTAR LHX 20 with air/water heat exchanger

---

Further information:

[www.a-tca.com](http://www.a-tca.com) or AdvancedTCA E-mail hotline:

Europe, Asia: [infoATCA@schroff.biz](mailto:infoATCA@schroff.biz)

America: [infoATCA@pentair-ep.com](mailto:infoATCA@pentair-ep.com)

Responsible for contents and print

Schroff GmbH, Marketing Communication, D-75334 Straubenhardt, Germany

The details in this catalogue have been carefully compiled and checked – supported by the certified Quality Management System to EN ISO 9001/2000.

The company cannot accept any liability for errors or misprints. The company reserves the right to amendments or technical specifications due to further development and improvement of products.

Instant access to expert knowledge

# Support and information se

[www.a-tca.com](http://www.a-tca.com)



**Advanced Telecom Computing Architecture**

**Schroff AdvancedTCA**      **Schroff AdvancedMC**      **Schroff μTCA**

<b>COMPANY BACKGROUND</b>	<p><b>Advanced Telecom Computing Architecture</b></p> <p>Schroff and Electronic Solutions offer systems designers the most comprehensive AdvancedTCA, AdvancedMC and MicroTCA packaging technology in the industry.</p> <ul style="list-style-type: none"><li>• AdvancedTCA Front Panels and Accessories</li><li>• Hot Swap Handles</li><li>• Filler Panels and Air Baffles</li><li>• AdvancedMC Products 6U and 8U MicroTCA Development Systems</li><li>• 2, 5/6, 14, and 16 slot AdvancedTCA Systems</li><li>• Shelf Management Technology</li><li>• Engineered Solutions</li></ul> <p><i>Schroff and Electronic Solutions packaging technology offers these benefits to designers:</i></p> <ul style="list-style-type: none"><li>+ <b>Performance</b></li><li>+ <b>Flexibility</b></li><li>+ <b>Price</b></li><li>+ <b>Time-to-Market</b></li></ul> <p><i>high processing densities maximum operability</i></p>
About	
Global Capabilities	
Manufacturing Locations	
<b>PRODUCT INFORMATION</b>	
AdvancedTCA Systems	
AdvancedMC	
MicroTCA	
Front Panels & Accessories	
<b>ROHS</b>	
<b>SUPPORT INFORMATION</b>	
Datasheets	
Manuals	
Firmware	
Drawings	
Reference Information	
<b>ATCA ACADEMY</b>	
Reference Information	
Photo Gallery	
WebSeminars	
Links	
<b>NEWS AND EVENTS</b>	
Latest News	
Press Room	
Events	
<b>CONTACT INFORMATION</b>	

**NEW**  
**MicroTCA Chassis**  
[CLICK HERE FOR DETAILS](#)

Schroff on the Internet – convenient and always up-to-date.



## Comprehensive documentation online, updated daily

# Service

### AdvancedTCA, MicroTCA and AdvancedMC knowledge portal

- **Know-how: profit from news, events and seminars**
- **Service: the latest information around the clock**
- **Added value: drawing downloads, specifications, firmware and more...**

#### Knowledge transfer and partnership.

Knowledge is the one resource that increases when it is shared - assuming openness. Schroff gives you access to a broad spectrum of knowledge and experience relating to the latest technologies and special product information, through to individual training on our AdvancedTCA, MicroTCA and AdvancedMC packaging solutions. Whether it is basic training or seminars for developers and professionals, we always have the same goal: to support you practically and systematically in order to optimize your processes and make you more successful in your core activities.

#### Development and product support.

We are always there for you, with an abundance of technical information and service tools - worldwide. We can advise you on optimizing your system performance and assure the long-term availability of your applications. This is our understanding of quality of service. We make available a broad array of supporting materials such as product data sheets, firmware and downloadable drawings and advise you individually on technical questions. Regular software updates ensure the stability of your systems and keep them current.

# www.a-tca.com

### SUPPORT INFORMATION

- **Here you can find easy-to-download information and tools to help you develop and implement AdvancedTCA and MicroTCA systems:**  
Data sheets, handbooks, firmware, drawings, reference information, technical articles, brochures, background information, test reports and much more.

### ACADEMY, NEWS AND EVENTS

- **Our tailor-made basic and advanced training programmes make for an uncomplicated transfer of knowledge. Check for current dates of our seminars and events worldwide or take advantage of more contemporary means of knowledge transfer - webinars, webcasts and white papers, in the comfort of the Internet!**

## Schroff's product services program

# ServicePLUS

Simply a perfect performance!



## configuration

Simple. Fast. To the ideal product.

Individual combination and variation of components

- Interactive configurators on the Internet
- Configuration tables in the catalog
- Configuration hotline by telephone

With ServicePLUS configuration we offer fast, uncomplicated combination of your ideal, individual product based on standard components.

- unlimited combinations
- error-free choices
- simply ordering

## modification

Small changes. Large impact.

Customer specific machining, cut-outs, printing and special colors for standard products

- Cabinets
- 19" cases
- Subracks
- Front panels
- Backplanes
- Power supplies

Quality also means 100 % compatibility. Therefore Schroff modify standard products to individual demands. With ServicePLUS modification the customer receives nearly every customization competently, fast and at favorable terms.

- enjoy flexibility
- modify trouble-free
- order exactly to your requirements

## assembly

Assembled by professionals. Double benefit!

Assembly of all mechanical, electrical and electronic components by our experts

- Cabinets
- 19" cases
- Subracks

ServicePLUS assembly provides you with the security that the operation-ready products allow you to devote your time to your core tasks, as we are pleased to undertake the entire assembly of components professionally and in time.

- simply concentrate on your competences
- save valuable time
- know that everything fits

## solution

Simple. Everything. From one source.

Complete and tested operational systems and customer specific developments

- System integration for cabinets, Outdoor enclosures, Embedded systems
- Customized product developments

ServicePLUS solution combines our decades of experience in integration of mechanics, electronics and climate control. You profit from fully integrated, operational systems and customized new developments.

- express requirements uncomplicatedly
- receive your individual solution
- obtain security and partnership

**Valuable. Comprehensive. Concise.**

# ServicePLUS

**Custom service – throughout a product's lifetime.**

## express

**When fast has to be faster.**

Delivery times to customers' request, at additional cost, on top of the ServicePLUS modules:

- assembly
- modification
- solution
- support

For many projects speed is essential and flexibility is a deciding factor. ServicePLUS express offers maximum flexibility with various express options.

- plan economically
- error-free choices
- receive extra fast delivery

## academy

**Knowledge. Sharing. Partnerships.**

Knowledge transfer and partnership . . .

- In-depth seminars for products and technologies
- Virtual and interactive knowledge transfer via multimedia: webinars, webcasts and white papers.

With ServicePLUS academy Schroff offers uncomplicated access to expert knowledge. After all, sound manufacturer know-how contributes to trouble-free availability in your business, too.

- hands-on training
- simply download expert knowledge
- pick-up ideas for the future

## support

**Support. Solution. Availability.**

Assistance on request

- Telephone hotline with flexible response times
- Remote diagnosis, remote control
- Software updates

With ServicePLUS support we stand by you with help and advice even after the sale. With our modular support package we are always available should the need arise and will fulfil your specific service needs.

- get fast assistance
- minimize down time
- feel secure not to be on your own

(Some services might not be available in every country)

## lifecycle

**Custom service. Throughout a product's lifetime.**

- Delivery to the operating site
- Commissioning
- Guarantee extensions
- Maintenance, repairs, replacement parts
- Recycling

With ServicePLUS lifecycle you profit from a flexible customer care during the entire life cycle of your products and turnkey solutions. Design your individual Lifecycle Package.

- decide securely
- choose your service
- be well looked after



Data and Facts

# PICMG 3.0 AdvancedTCA

## Specification overview



The Advanced Telecom Computing Architecture specification is tailored to meet the needs of the telecoms market. The modern architecture (serial point-to-point connections) however makes AdvancedTCA systems also suitable for other markets in which a high data throughput is necessary, such as server applications, medical technology or research.

The board form factor was defined as: height 8 U, width 6 HP, depth 280 mm, depth of I/O board 70 mm (RTM = Rear Transition Module). This size of board allows sufficient space for the components required and offers optimal cooling. The boards are EMC-shielded, and special handles are provided for inserting and removing the plug-in units in order to overcome the high insertion and extraction force required.

In AdvancedTCA data transfer takes place via high-speed serial point-to-point connections. The following point-to-point topologies are typically employed:

- Dual Star (all slots are connected to a star point)
- Dual Dual Star (all slots are connected to two star points)
- Full Mesh (each slot is connected to every other slot)

The overall data transfer rate can, in certain systems, exceed 1 Tbps.

A typical system consists of two redundant switchboards and a number of node boards (number dependent on application and chassis width). The outer dimensions are based on the existing industry standards: 19" (IEC 60297) and ETSI (ETS 300 119-3).

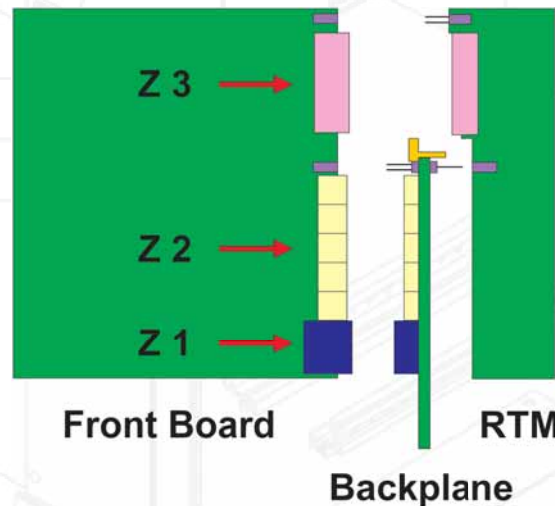
AdvancedTCA systems are designed for a maximum heat loss of 200 W per front board and 15 W per RTM board. In some system versions it is necessary to remove more than 3000 W of generated heat. Cooling is via fans and is a purely air-cooling system.

The specification describes data transport mechanisms that can be operated in parallel to one another:

- PICMG® 3.1 Ethernet/Fibre Channel
- PICMG® 3.2 InfiniBand
- PICMG® 3.3 StarFabric
- PICMG® 3.4 PCI-Express and Advanced Switching
- PICMG® 3.5 Serial Rapid I/O™

The backplanes of an AdvancedTCA system are divided into three distinct zones.

- In Zone 1 the boards are supplied with power. The shelf management system communicates via the IPMI channels of the Zone 1 connector.
- Zone 2 is divided into two sections: The base interface provides internal communication between the boards, while the fabric interface serves the high-speed transfer of the large data volume (payload).
- Zone 3 is openly defined in the AdvancedTCA specification. The connection may be made in two ways: a direct link via connectors, or via a customized, so-called zone 3 backplane.



## Data and Facts

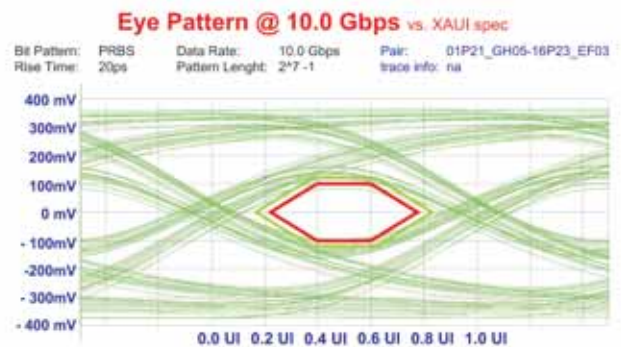
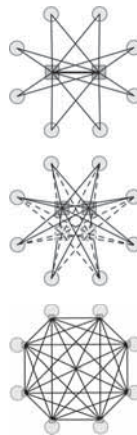
- **Topologies: Dual Star, Dual Dual Star, Full Mesh**
- **Radial and bussed IPMI topology**
- **Shelf management**

### Dual Star, Dual Dual Star, Full Mesh

Schroff supports multiple AdvancedTCA backplane topologies.

In designing the AdvancedTCA specification the principal goal was a scalable architecture that permits the balancing of performance and cost. A further aim was to replace parallel buses on the backplane, as these led to data jams and were a frequent cause of failure. The AdvancedTCA backplane is the first backplane to be built to an open standard, on which only packet-based architectures (switched fabrics) are supported. Scalability is assured through the various topology options, which support one, two or four ports per channel (link between slots) and through the Dual Star, Dual Dual Star or Full Mesh connections.

- In a Dual Star topology all slots are connected to a star point on which a fabric switch is situated. A second switch (dual) assures the redundancy that is important for system availability. All AdvancedTCA boards communicate with one another via the switches in the hub slots.
- Where higher performance is required, a second group with two redundant switches may be added, so creating a Dual Dual Star configuration.
- Maximum performance is obtained with a Full Mesh configuration, whereby each slot is connected directly to every other slot. Here a data transfer rate of over 2.5 Tbps is possible.



### Shelf management

Schroff offers the latest shelf management products for AdvancedTCA systems.

The shelf manager controls and monitors the boards, fans, temperature and power supplies. The introduction of electronic coding was an important focus in the standardization work. This coding ensures that only compatible AdvancedTCA boards are enabled. When an AdvancedTCA board is fitted into the shelf, the shelf manager compares the features of the board with those available in the system. It compares power, cooling and fabric signaling levels (protocols) for each channel, the ports available per channel and the backplane topology with the characteristics of the new entity at the other end of the fabric connection. The shelf manager then allocates power to the board, allows the board to 'power up' and enables only those features of the board that are compatible with the remainder of the shelf. This detailed shelf management avoids harm to the board through electrical incompatibility and prevents an unreliable system configuration. Additionally, the shelf manager compiles a list of the boards and components installed in the shelf. (Remote) access to this list can be obtained via a network interface to the shelf manager.

### Radial and bussed IPMI topology

IPMI (intelligent platform management interface) is used for system management. This is used by the shelf manager to communicate with the individual AdvancedTCA boards. The connection may be either over a redundant bus (bussed) or via a star point to each board (radial).

## Data and Facts

# PICMG MicroTCA.0 R1.0

## Specification overview



The Micro Telecom Computing Architecture specification is tailored to meet the needs of the telecoms market. The modern architecture (serial point-to-point connections) however makes MicroTCA systems also suitable for other markets in which a high data throughput, small form factor or scaleable architecture is necessary, such as medical technology, security systems, industrial automation, defense systems, traffic control or image processing.

In MicroTCA the boards used are the existing mezzanine cards - AdvancedMC modules - of AdvancedTCA. These are defined in 6 sizes: single and double modules, with the following "widths" (defined in the AdvancedMC specification as height): compact (3 HP), mid-size (4 HP) and full-size (6 HP). Since AdvancedMC modules were defined as mezzanine cards for the AdvancedTCA carrier, the PCB of the module is not on the left-hand side of the module, as with previously-specified boards (VME, CompactPCI or AdvancedTCA), but on the right, with the components protruding leftward.

In MicroTCA, data transfer is via very fast serial point-to-point connections. The following point-to-point topologies are defined:

- Star (all slots are connected to a star point)
- Dual star (all slots are connected to two star points; the second star provides redundancy)
- Point-to-point (direct connections between individual AdvancedMC modules)

Overall data transfer can in certain systems be up to 480 Gbps.

A maximum of 12 AdvancedMC modules are defined in a MicroTCA carrier, while a number of such carriers can be cascaded in one shelf. The physical form of the system and shelf structure is open. Both 19" (IEC 60297) and ETSI (ETS 300 119-3) widths are possible, while more compact enclosures such as cube or pico can also be realized with MicroTCA.

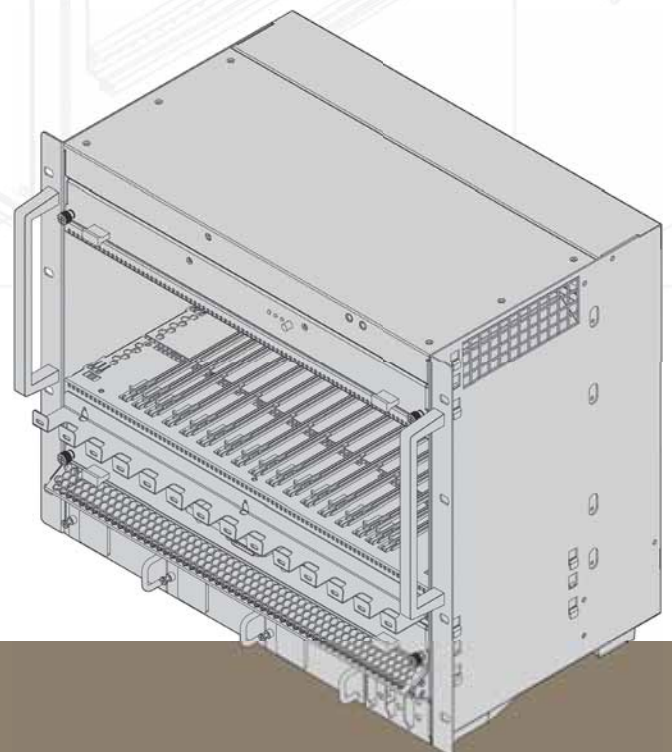
AdvancedMC modules are defined for a maximum heat loss of between 20 W (single compact module) and 80 W (double full-size module). The MicroTCA specification further defines the maximum heat loss values for 19" MicroTCA carriers: these range from 560 W for a configuration with max. 12 single full-size modules to 1120 W for a system with double full-size modules.

All the data transport mechanisms defined in the AdvancedMC sub-specifications may be used in MicroTCA:

- PCI Express and Advanced Switching (AMC.1)
- Gigabit Ethernet (AMC.2)
- Storage Interface (AMC.3)
- Serial Rapid I/O (AMC.4)

Work is currently in progress on the first MicroTCA sub-specification, MicroTCA.1 (Rugged MicroTCA). The aim of the specification is to employ MicroTCA in environments with high demands from shock and vibration. The first tests on the mechanical and electrical interfaces (AdvancedMC handle including interlocking and connectors) in accordance with IEC 61587-1 and VITA 47 have been very promising.

MicroTCA uses the management structure of AdvancedTCA with the latter's defined shelf and system management and the carrier management of the AdvancedMC carriers. Here, however, a new module is defined in the AdvancedMC form factor: the MCH (MicroTCA carrier hub), which performs both carrier management and the fabric functionality.



## Data and Facts

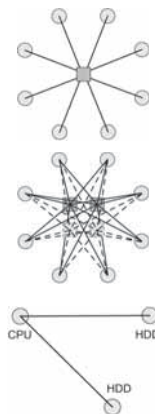
- **Star and Dual Star topologies or direct connections**
- **Transfer rates of up to 10 Gbit per second per port**
- **Carrier and shelf management**

### A range of topologies optimized for your application

Schroff has now developed a large number of MicroTCA backplanes with various topologies.

In designing the MicroTCA specification the principal goal was a scalable architecture that permits the balancing of performance and cost. Further aims were, firstly, to replace parallel buses on the backplane, as these lead to data jams, and secondly, protocol independence for the data lines on the backplane. Like AdvancedTCA, MicroTCA replaces the parallel bus with packet-based data-transport mechanisms (switched fabrics). Scalability is provided with the various transfer protocols defined in the AdvancedMC sub-specifications and through the choice of Star or Dual Star topologies or direct connections.

- **In a star topology all AdvancedMC modules are connected to a star point on which a fabric switch is situated. All AdvancedMC modules communicate with one another via the switch, which in MicroTCA is located on the MicroTCA carrier hub (MCH).**
- **In a Dual Star topology a second switch (dual) is provided which ensures redundancy that is important for system availability.**
- **With a direct connection, two AdvancedMC modules may exchange data directly, without diversion via a switch. This method is used, for example, to link one or two hard disks to a CPU via S-ATA or SAS.**



### Carrier and shelf management

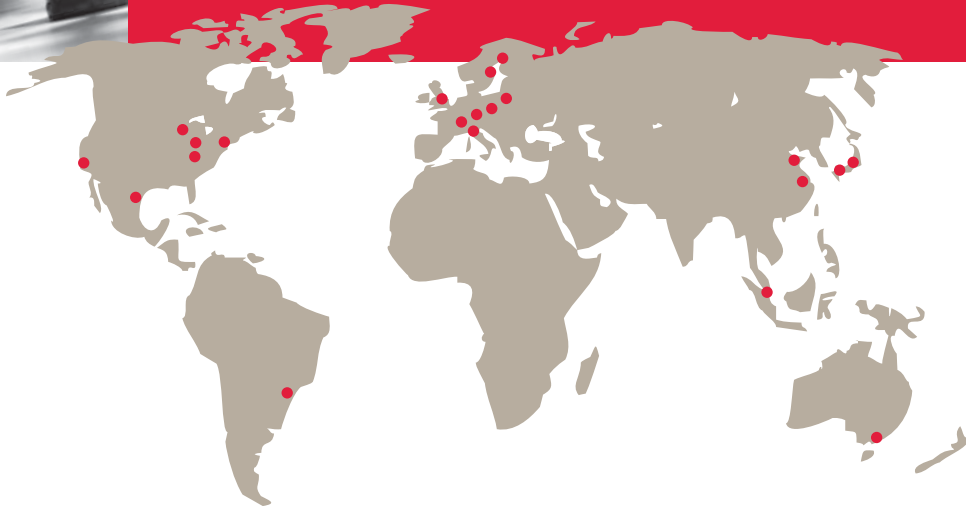
**Schroff works closely with many MCH, AdvancedMC and PM (power module) manufacturers to ensure management compatibility.**

The shelf manager controls and monitors the boards, fans, temperature and power supplies. The electronic coding ensures that only compatible AdvancedTCA modules are enabled. When an AdvancedTCA module is fitted into the shelf, the shelf manager compares the features of the module with those available in the system. It compares power, cooling and fabric signaling levels (protocols) and the backplane topology with the characteristics of the new entity at the other end of the fabric connection. The shelf manager then allocates power to the module, allows the module to 'power up' and enables only those features of the module that are compatible with the remainder of the shelf. This detailed shelf management avoids harm to the module through electrical incompatibility and prevents an unreliable system configuration. Additionally, the shelf manager compiles a list of the modules and components installed in the shelf. (Remote) access to this list can be obtained via a network interface to the shelf manager.

Schroff offers systems with cooling unit management and with power module management. In MIWs (MicroTCA Interoperability Workshops) and through direct collaboration with MCH, AdvancedMC and PM manufactures, the compatibility of Schroff systems with these components has been and will continue to be tested and guaranteed.

# Established as one of the best

Worldwide market competence. Local to you.



As a partner for the global electronics industry we are established as one of the best.

As an international company, Schroff takes advantage of the opportunities offered by globalisation. Manufacturing and development locations in Europe, America and Asia make worldwide market competence possible in the first place. Decentralised marketing and distribution networks with over 50 representations worldwide guarantee both closeness to our customers and optimal satisfaction of local market demands.

Up-to-date, detailed contact information for all our branches and representations can be found on our web site:

**[www.schroff.biz](http://www.schroff.biz)**

## Pentair Technical Products Group and Representations

**Schroff GmbH**

Langenalber Straße 96-100  
75334 Straubenhardt  
Deutschland  
Tel. +49 (0)7082 794-0  
[www.schroff.de](http://www.schroff.de)

**Schroff Scandinavia AB**

Flygfältsgatan 11  
P.O. Box 2003  
12821 Skarpnäck  
Sweden  
Tel. +46 (0) 8 683 61 00  
[www.schroff.se](http://www.schroff.se)

**Schroff GmbH/**

**Sp.z.o.o./-oddzial w Polsce**  
ul. Marynarska 19A  
PL-02-674 Warszawa  
Poland  
Tel. +48 (0) 22 607 06 16  
[www.schroff.pl](http://www.schroff.pl)

**Pentair Electronic Packaging**

170 Commerce Drive  
Warwick RI 02817  
USA  
Tel. +1 (401) 732-3770  
[www.schroff.us](http://www.schroff.us)

**Schroff UK Ltd.**

Maylands Avenue  
Hemel Hempstead  
Herts HP2 7DE  
Great Britain  
Tel. +44 (0)1442 240 471  
[www.schroff.biz](http://www.schroff.biz)

**Schroff Scandinavia AB**

Peräsimentie 8  
FIN-03100 Nummela  
Finland  
Tel. +358 9 222 68 00  
[www.schroff.fi](http://www.schroff.fi)

**Schroff K.K.**

Nisso No.13 Bldg. 4F  
2-5-1 Shinyokohama, Kohoku-ku  
Yokohama-shi  
Kanagawa 222-0033  
Japan  
Tel. +81 (0)45 476 02 81  
[www.schroff.co.jp](http://www.schroff.co.jp)

**Pentair Technical Products China**

Shuangyuan Rd. South, Liuting, Chengyang  
District (Airport Ind. Zone)  
Qingdao, PC 266108  
PR China  
Tel. +86 532-8771 6101  
[www.schroff.biz](http://www.schroff.biz)

**Schroff SAS**

Z.I. 4, rue du Marais  
Boîte Postale 16  
67660 Betschdorf  
France  
Tel. +33 (0)3 88 90 64 90  
[www.schroff.biz](http://www.schroff.biz)

**Schroff S.r.l.**

Via Brughiera 1  
20010 Pregnana Milanese (MI)  
Italy  
Tel. +39 02 932 714-1  
[www.schroff.biz](http://www.schroff.biz)