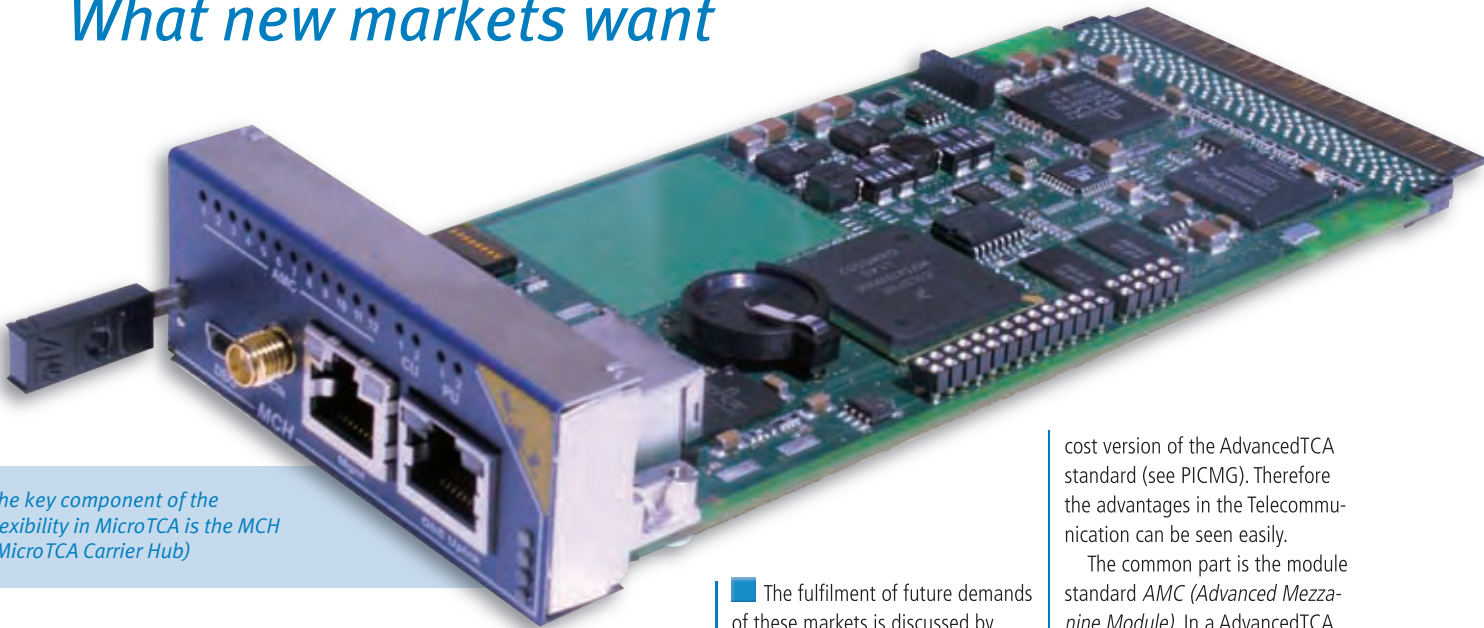


Innovation Enabler

What new markets want



The key component of the flexibility in MicroTCA is the MCH (MicroTCA Carrier Hub)

MicroTCA gets more and more important not just in Telecommunication, but also in the Industrial Automation, Defence and Aerospace, Research and Medical market.

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The fulfilment of future demands of these markets is discussed by introduction of some of the N.A.T. products. The goal of this article is, to show the benefits of MicroTCA to speed up innovation.

Even the MicroTCA standard is new, a fast market acceptance is visible. The reasons for this success are the future requirements. These are needs for faster product introductions into the market, higher scalability, reduction of life cycle costs and reuse of the same components in different applications to reduce development costs.

Technically the MicroTCA standard is well suited for this future demands.

It is based on the latest high speed interfaces, has enough power resources for systems with needs for high processing power and data throughput, and simplifies the service and the maintenance also remotely. For the industrial market mainly the flexibility in the architectures and the scalability is of high interest.

Smaller and lower cost version

The MicroTCA standard was invented as the smaller and lower

cost version of the AdvancedTCA standard (see PICMG). Therefore the advantages in the Telecommunication can be seen easily.

The common part is the module standard AMC (Advanced Mezzanine Module). In a AdvancedTCA system up to four hot swappable Full size modules or up to eight Compact size modules can be integrated on one ATCA carrier board. The same modules can also be pulled directly into the backplane of a MicroTCA system. Systems can be build with 1 AMC up to 12 AMC modules.

Therefore a telecommunication system can be scaled from a tiny 2 slot up to a 12 slot MicroTCA system, and further more from a 2 slot ATCA-AMC carrier system to a 5 slot up to a 14 slot ATCA system.

The future demands in industrial automation, medical and defense markets are also shorter product introductions to the market in conjunction with reducing the overall system lifecycle costs. To shorten the development time, flexible systems based on standard building blocks are needed. These have to be used in small, mid size and large systems. Separate developments of low cost and high performance systems based on different technologies are too expensive for future projects.

With MicroTCA systems one can combine the advantages of a PC (low price, speed of innovation) with the ones of VMEbus / CPCI systems (better cooling mechanism, better maintenance, longer life cycle). Because of the small form factor systems can be built now, which before were custom specific and based on modules like PMC.

To address a lot of different requirements the base of a MicroTCA system is a very flexible and scalable backplane architecture. Thanks to the trend from parallel busses to serial busses, the backplane only needs a lot of serial differential lanes based on a common standard, i.e. LVDS.

These serial lanes can be used as PCIe, 1 Gigabit Ethernet, 10 Gigabit Ethernet, Serial Rapid IO (SRIO) and also as customized serial busses or as Infiniband (not yet in the standard).

With this flexibility one can build systems of different sizes. These may start with a tiny 2 slot (i.e. wall mounted), to a 5 slot up to a 12 slot system (redundancy also available). If one has to scale up his system even more, the same AMC modules can be used on an ATCA-AMC carrier board. In a 14 slot system these will house 56 Full size or 112 Compact size AMC modules in a rack.

MCH is the key component

The key component of the flexibility in MicroTCA is the MCH (MicroTCA Carrier Hub).

In a very simple low cost system, the MCH is only used as management controller of the system. It can also provide via Ethernet and / or serial interface connection to the outside world. Additionally the NAT-MCH guarantees by E-Keying, that no AMC module will be powered up, that does not fit to the backplane, needs too much power, or is not allowed for this configuration. Optionally it can set up local and external alarms and events and react i.e. to high temperature or to hot swap request.

To scale the price and to fit the functionality to the project needs, N.A.T. designed a very modular NAT-MCH.

In a higher performance system, the NAT-MCH can be upgraded with more functions. In such systems the NAT-MCH is the backbone for all internal data communication. In such systems the NAT-MCH contains the switches for Gigabit-and/or 10 Gigabit Ethernet, Serial Rapid IO (SRIO) or PCIe.

As payload for MicroTCA and ATCA systems N.A.T. offers IO modules for Telecommunication, Industrial Automation, Defence and Aerospace, Research and Medical markets.

The NAMC-8560-xxx series contains a PowerQUICC III and is accessible by other boards through Gigabit-Ethernet, PCIe, IPMI and by custom specific busses i.e. H.110 alike bus. Due to the modular approach of the drivers as well as the board support package (BSP) and the IO support package

(i.e. Telecom support package TSP) the adaption to specific requirements can be performed also by the customer.

One example of this series is the NAMC-8560-8E1/T1/J1. It contains a PowerQUICC III with 8 E1/T1/J1 interfaces and a Gigabit Ethernet. The combination of E1 and Gigabit-Ethernet on one module makes it well suited for applications like VoIP, Media Gateways and Softswitches.

If higher channel density is needed, the NAMC-STM1 and NAMC-STM4 modules are available. These AMC modules do not contain a processor and all registers are accessible through the driver and the Telecom Support Package TSP, which supports Add/drop multiplexing for SDH.

All N.A.T. Telecom-IO-AMC modules may be used in termination of the WAN infrastructure or to monitor the data traffic for QoS purposes.

For markets demanding flexible IO N.A.T. offers beside the NAMC-8560-IO an AMC-PMC carrier NAMC-PMC to use PMC and PTMC modules in a MicroTCA system. This complements the AMC-IP carrier.

For measurements to an AMC module an AMC Extender is available. This NAMC-EXT can also be used in a standalone mode and only requires in this case 12 Volt. The 3.3 V management power is generated on the board.

The NAMC-8560-IO uses the PowerQUICC III with its intelligent serial interfaces.

SUMMARY

The modular approach of the NAT-MCH, all the possible bus topologies in the backplane, the amount of slots (scalability) and the possible chassis formats are the base of a broad usage of the MicroTCA systems in applications in Telecommunication, Industrial Automation, Defence and Aerospace, Research and Medical markets.

How can innovation be speeded up?

N.A.T. offers a quick start in the MicroTCA world with their NATIVE systems. The name NATIVE refers to the letters of NAT Innovation Enabler.

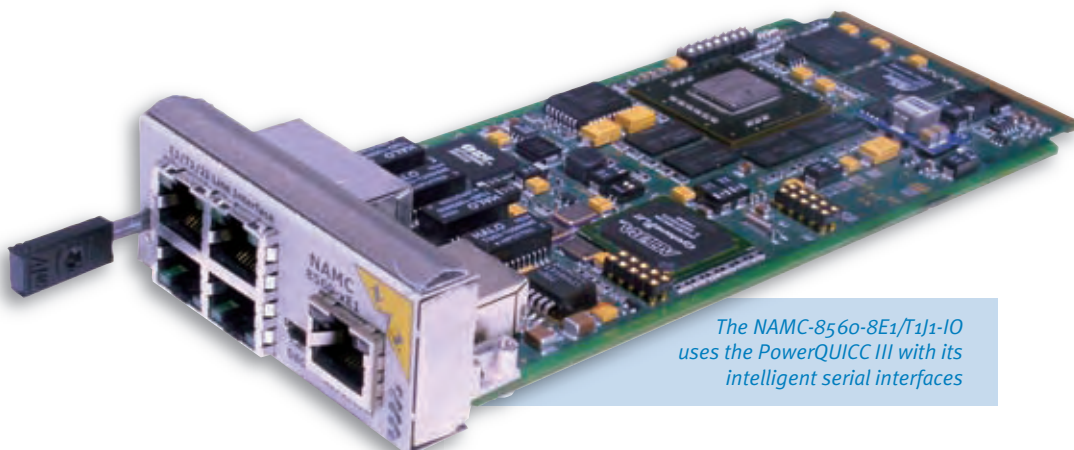
These complete systems consist of a chassis, backplane, power module and an NAT-MCH (options selectable), who implements the switches and acts as a Carrier Manager and optional also as Shelf and System Manager. With the NATIVE line of products the customer can select any AMC-CPU, AMC-IO and any operating system.

There are three versions of the NATIVE systems currently available:

- ▶ S: 5 Slot-AC-System
- ▶ M: 8 Slot-AC- or DC-System
- ▶ L: 12 Slot-DC-System including redundancy architecture

About us

N.A.T. is the specialist for high performance connectivity products for data and telecommunication solutions. The product portfolio is dedicated to the embedded market, covering requirements from local area networks (LAN) up to wide area networks (WAN). Our product range includes standard interface modules for local and wide area networks based on common hardware standards such as AMC, MicroTCA, VME, compact PCI, PMC, PCI and others.



The NAMC-8560-8E1/T1/J1-IO uses the PowerQUICC III with its intelligent serial interfaces