

Overview of Existing MicroTCA Modules on the Market

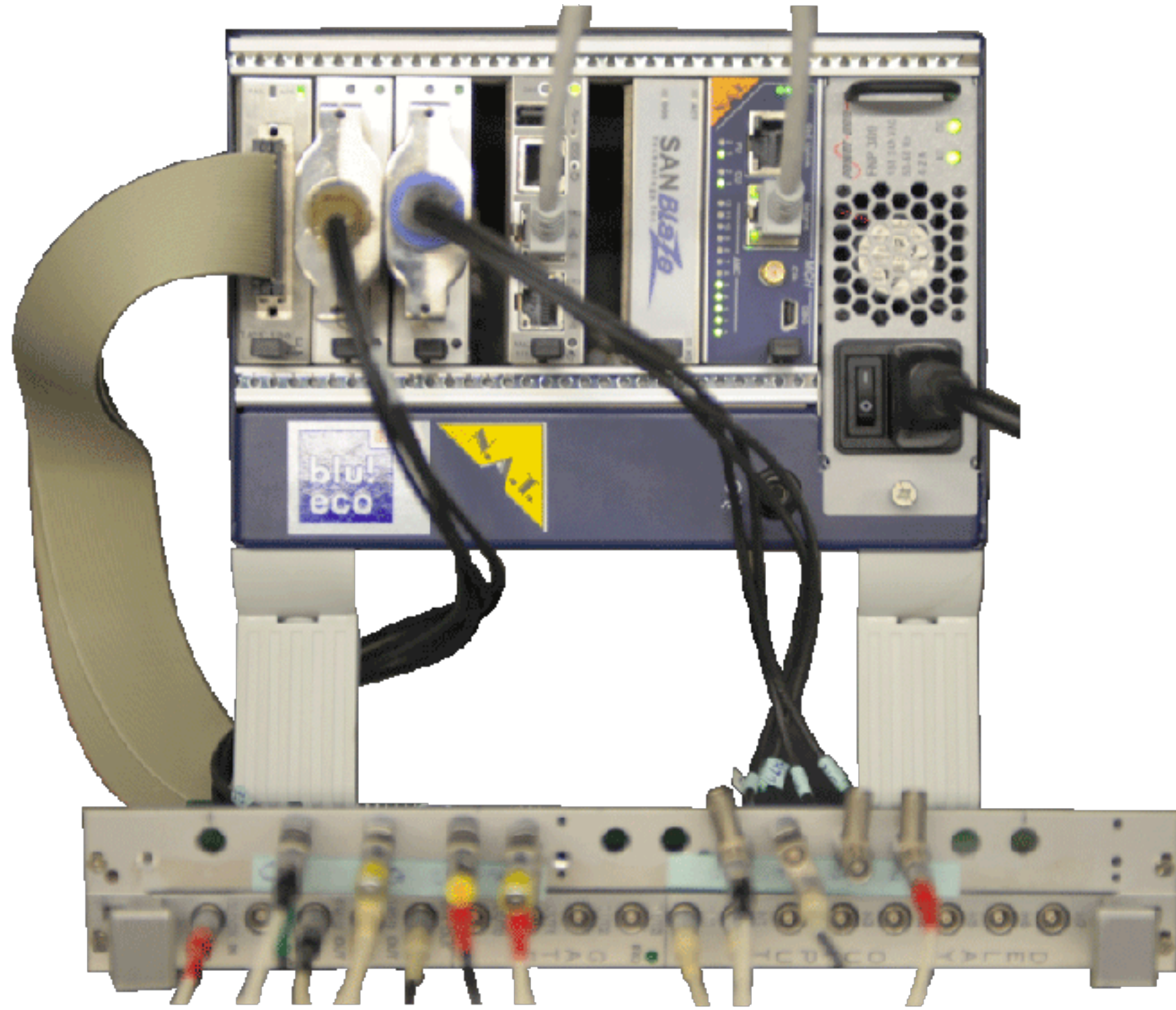
This list is by far **NOT** complete!

It shows the range of applications only

It shows modules one can buy, **NOT** in-house developments

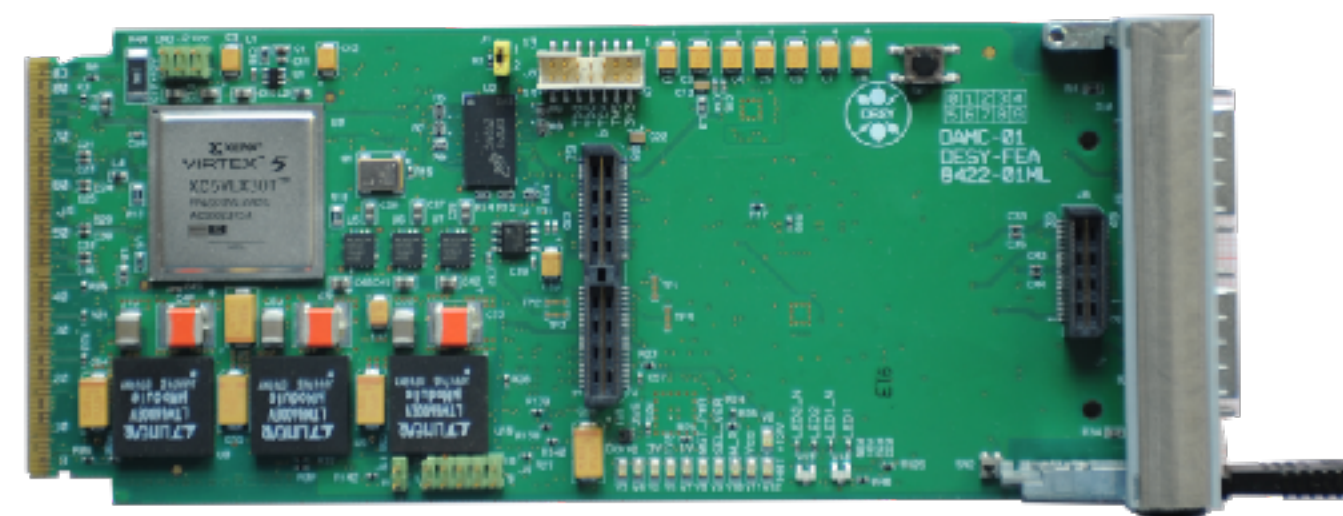
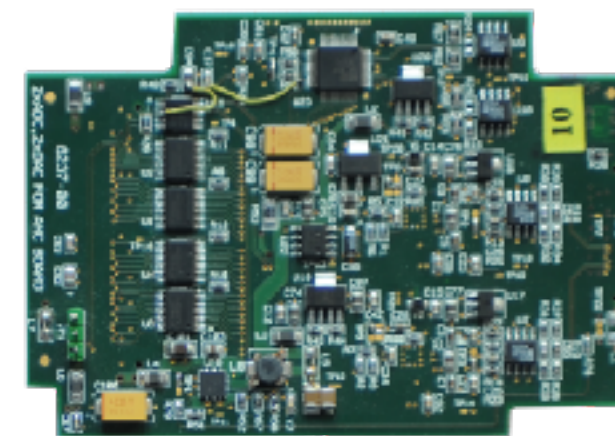
Kay Rehlich, DESY MicroTCA Technology Lab

The Early Days ...

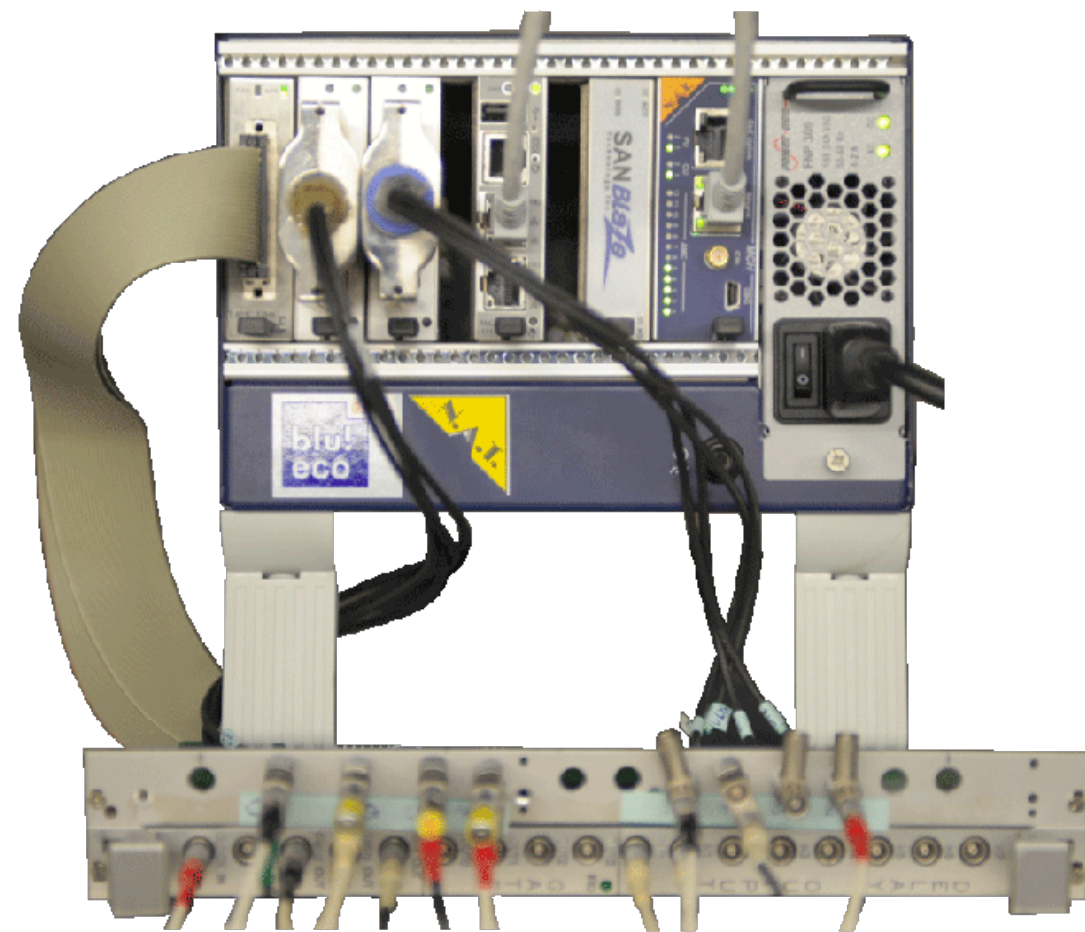


2009: first MicroTCA system @ DESY

- TAMC100 as carrier for IP Timing
- DESY development DMAC01 to understand the standard:
 - AMC with Virtex 5 and PCIe
 - MMC code on Atmega128
 - 2* ADC 100MSPS
 - DOOCS integration



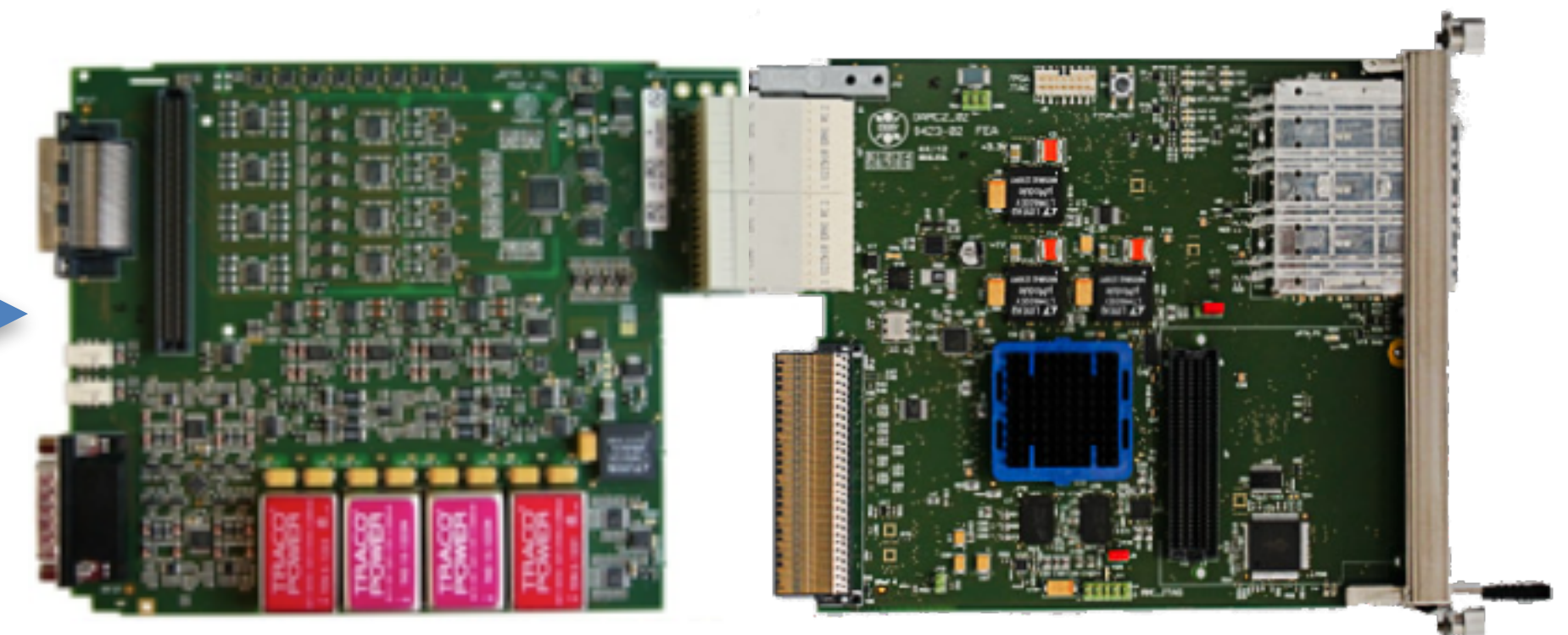
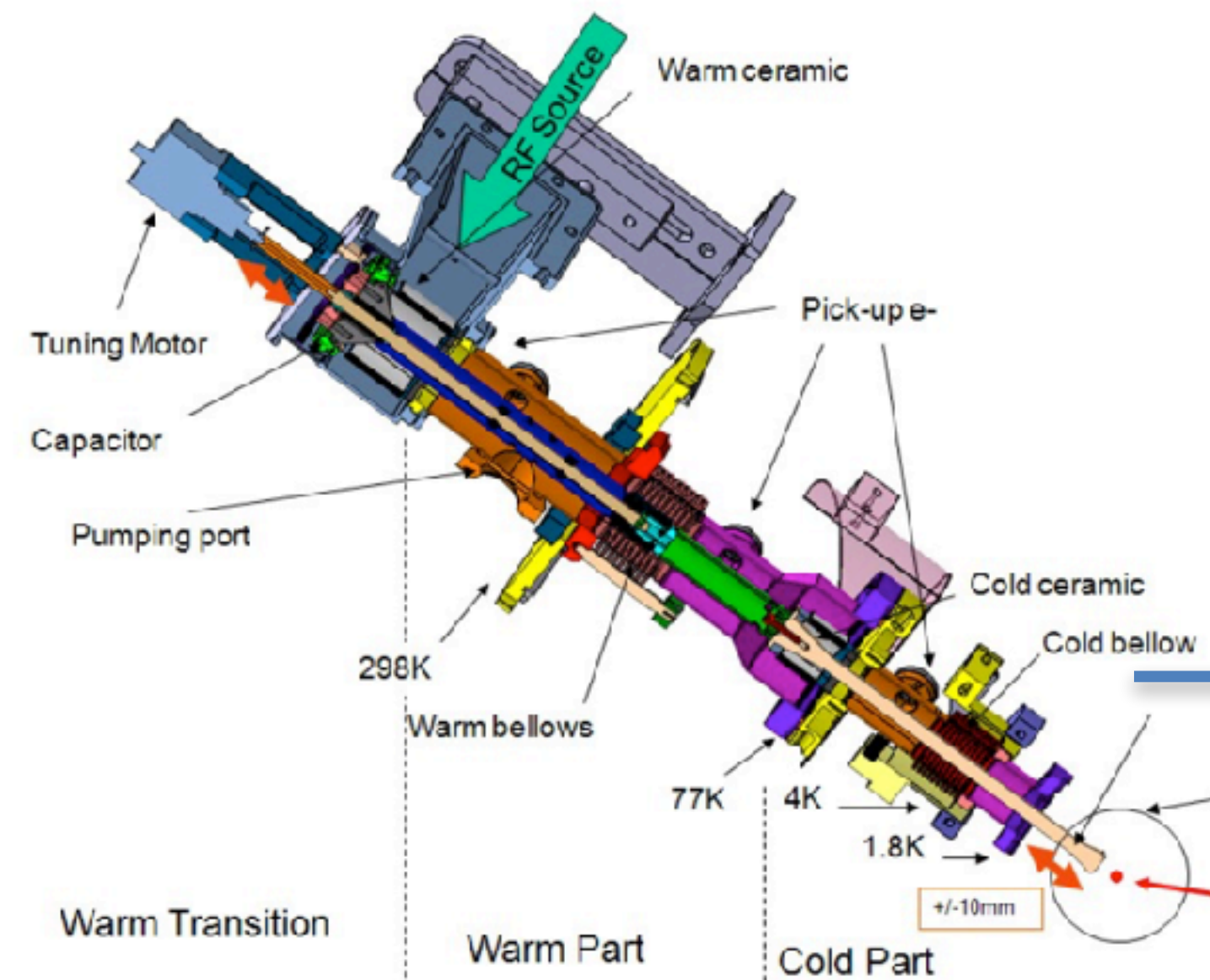
... 3.3 km European-XFEL Operation: 2017

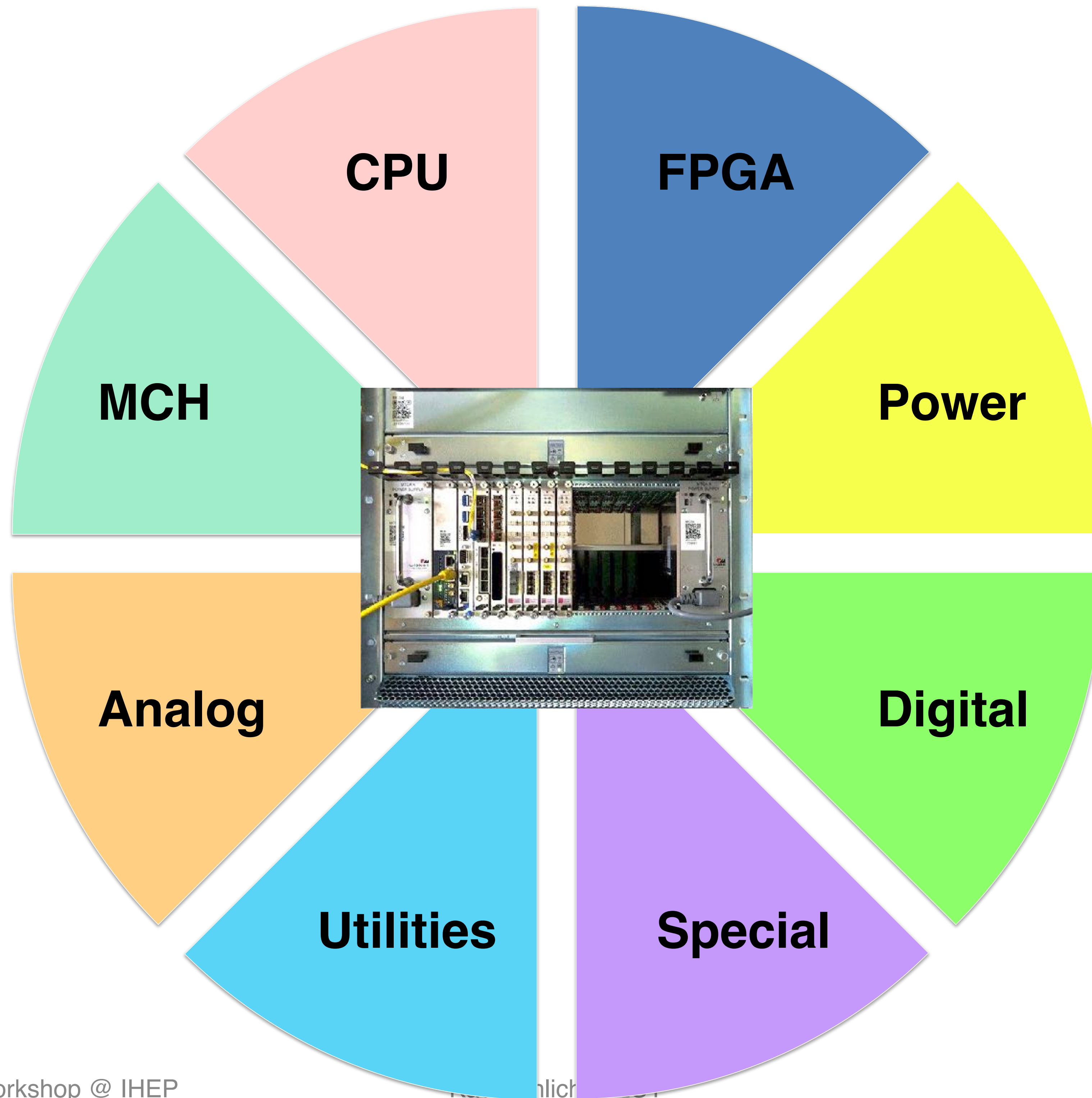


2009 ... 2015

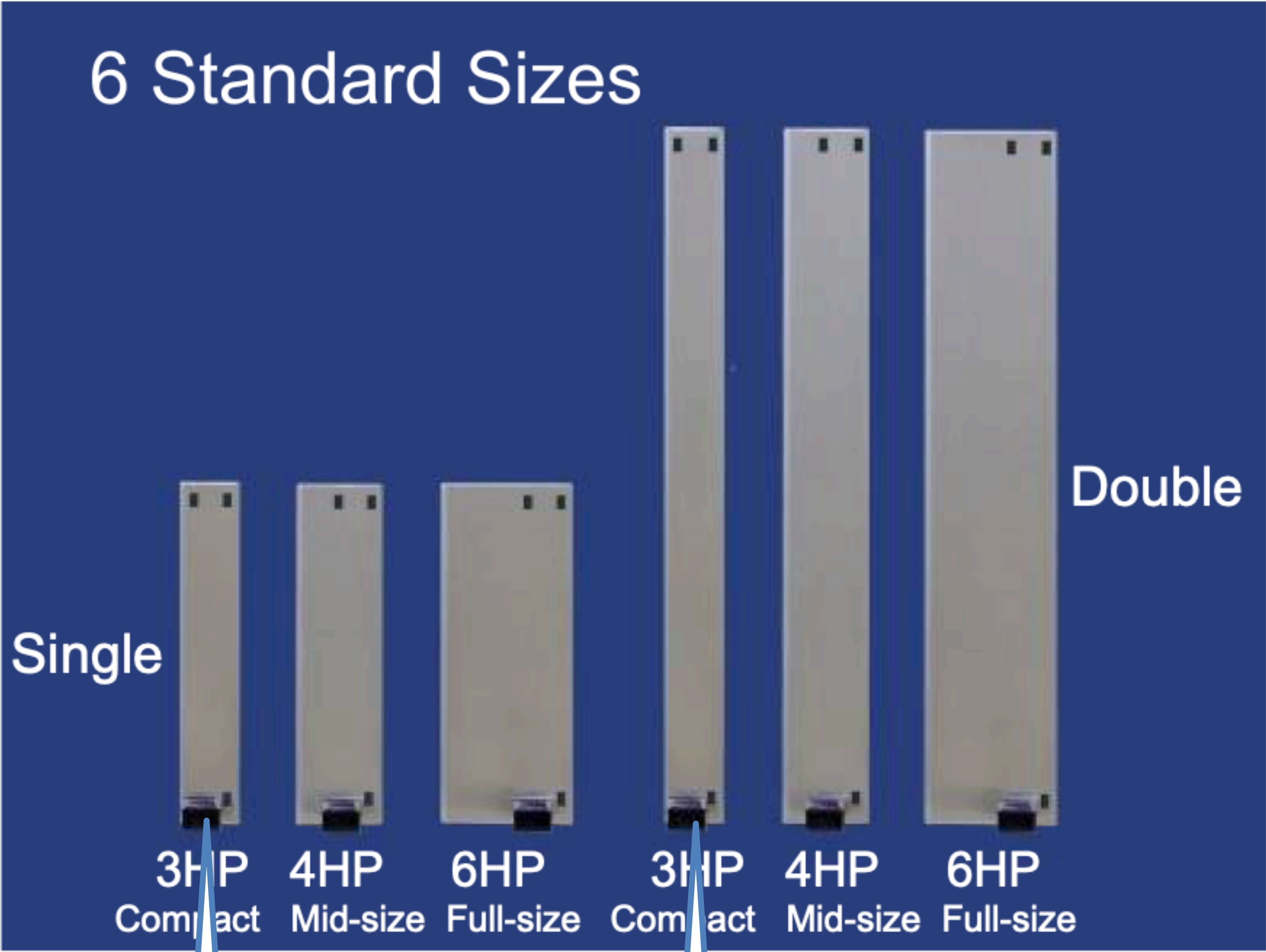
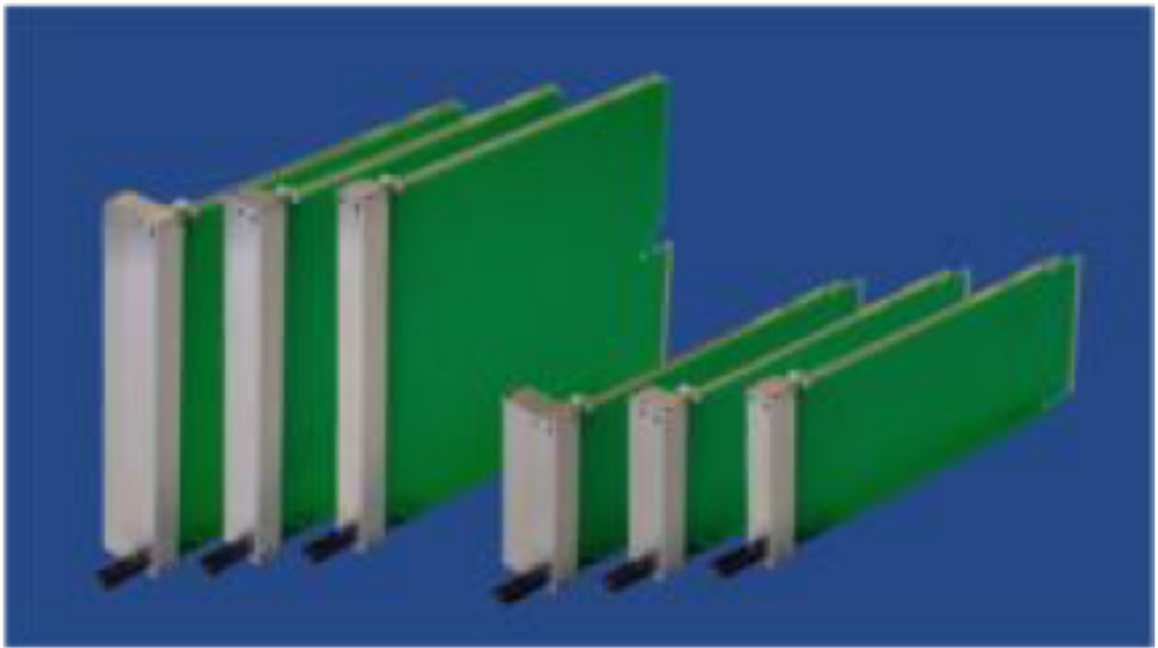
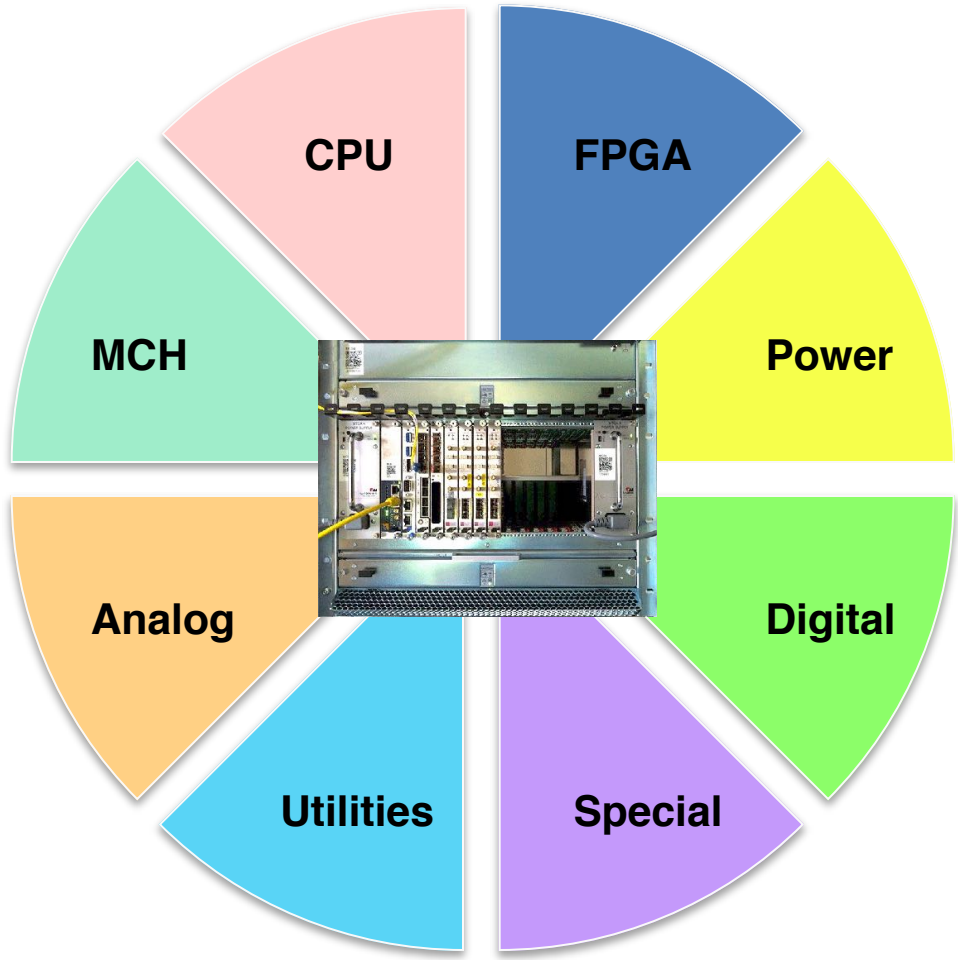


Dec 2015: XFEL Injector operation



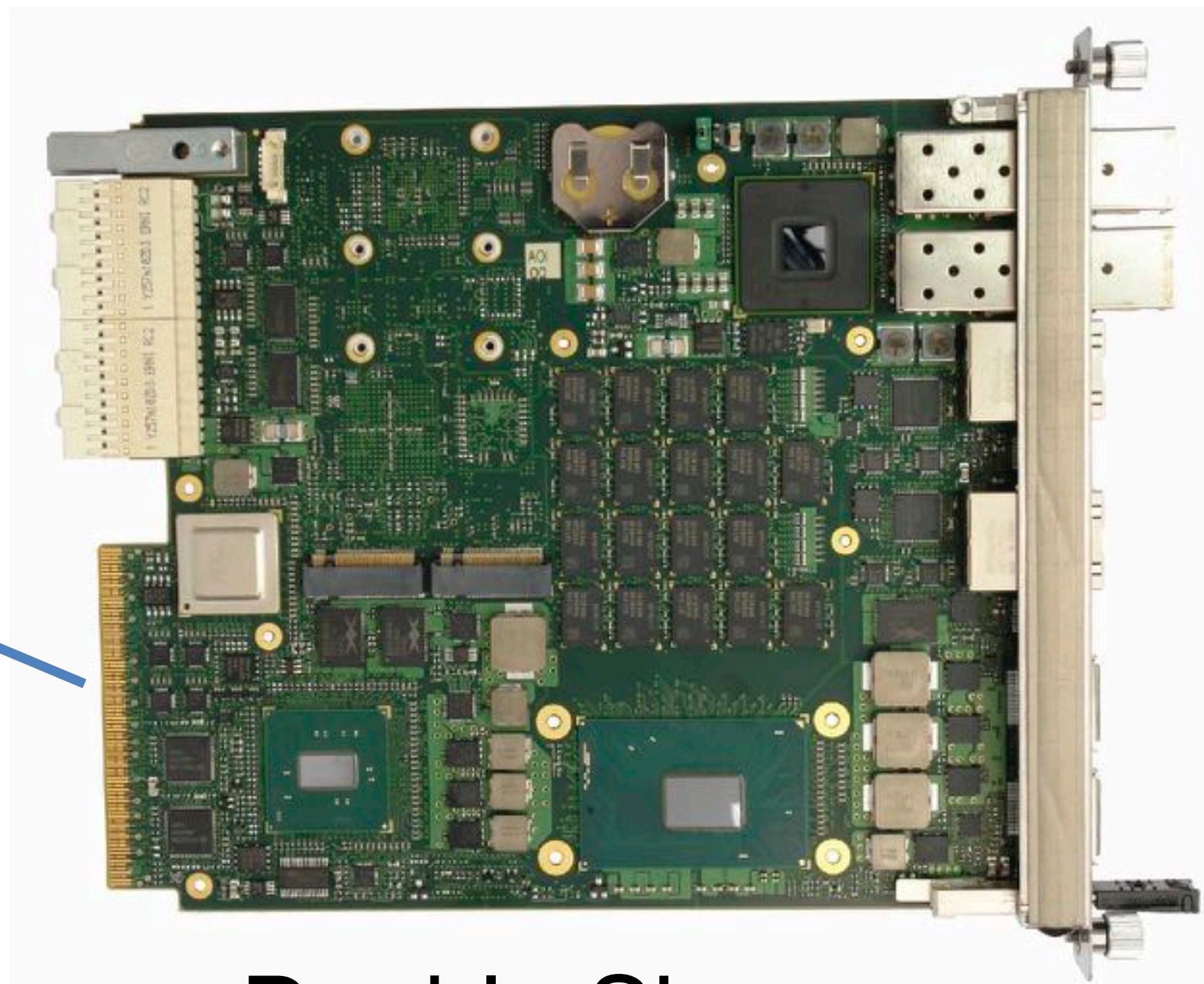
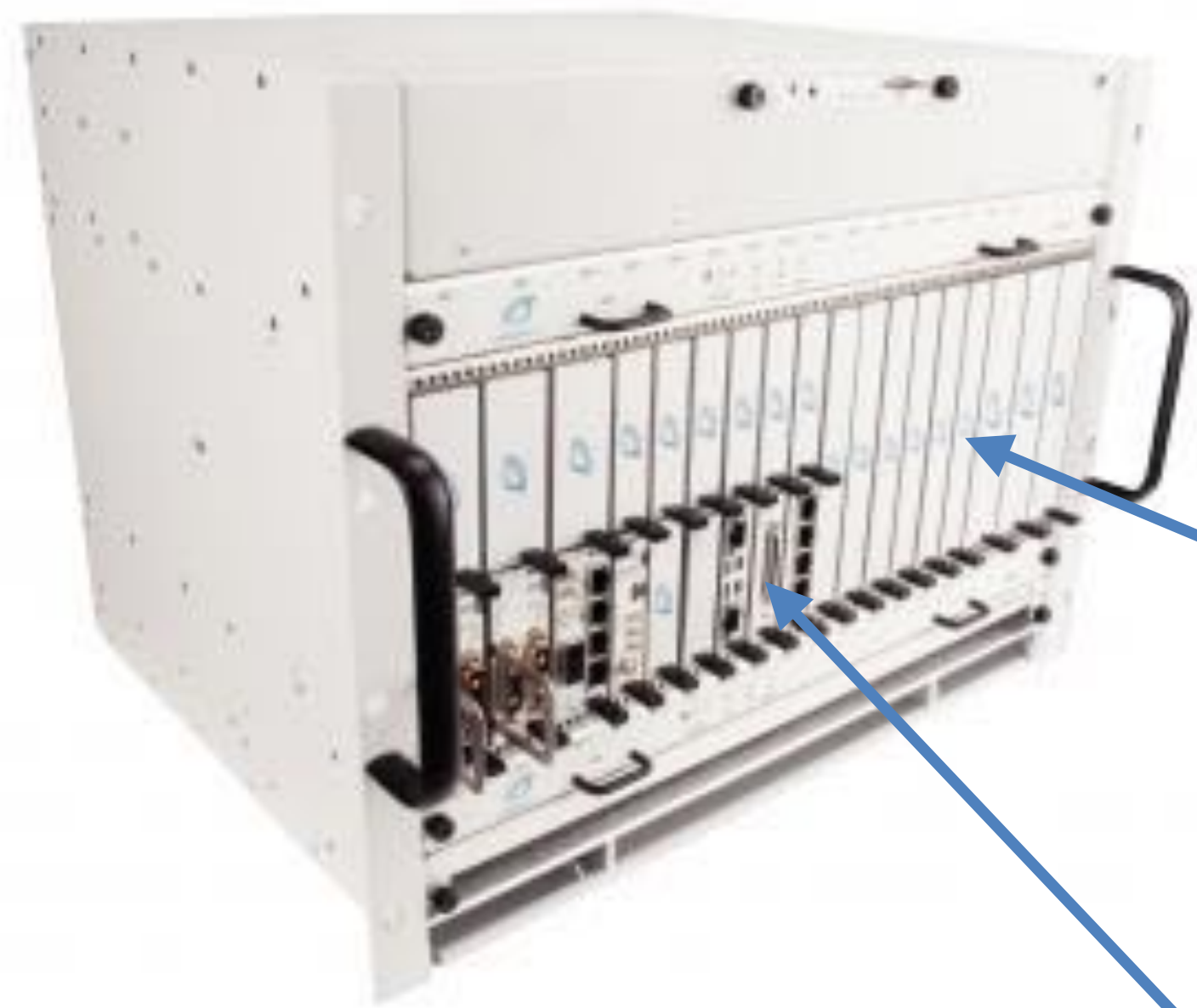
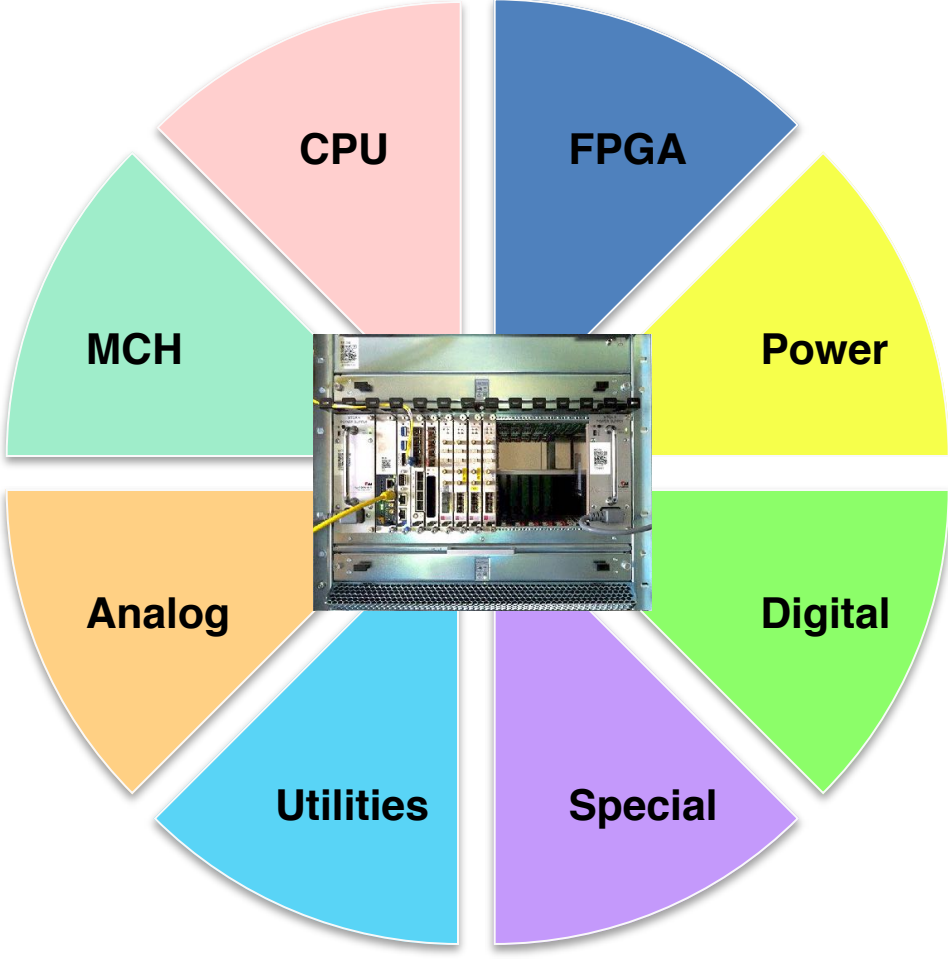


Compatibility of AMC Formats

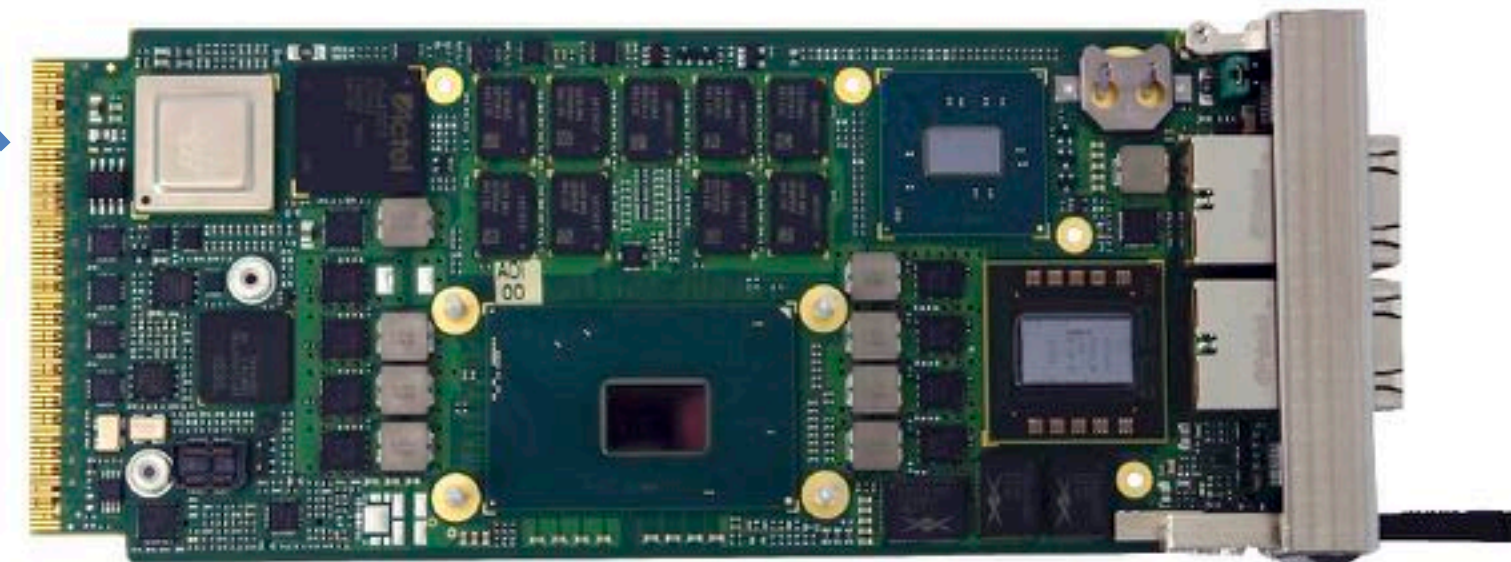


Compact format is seldom used

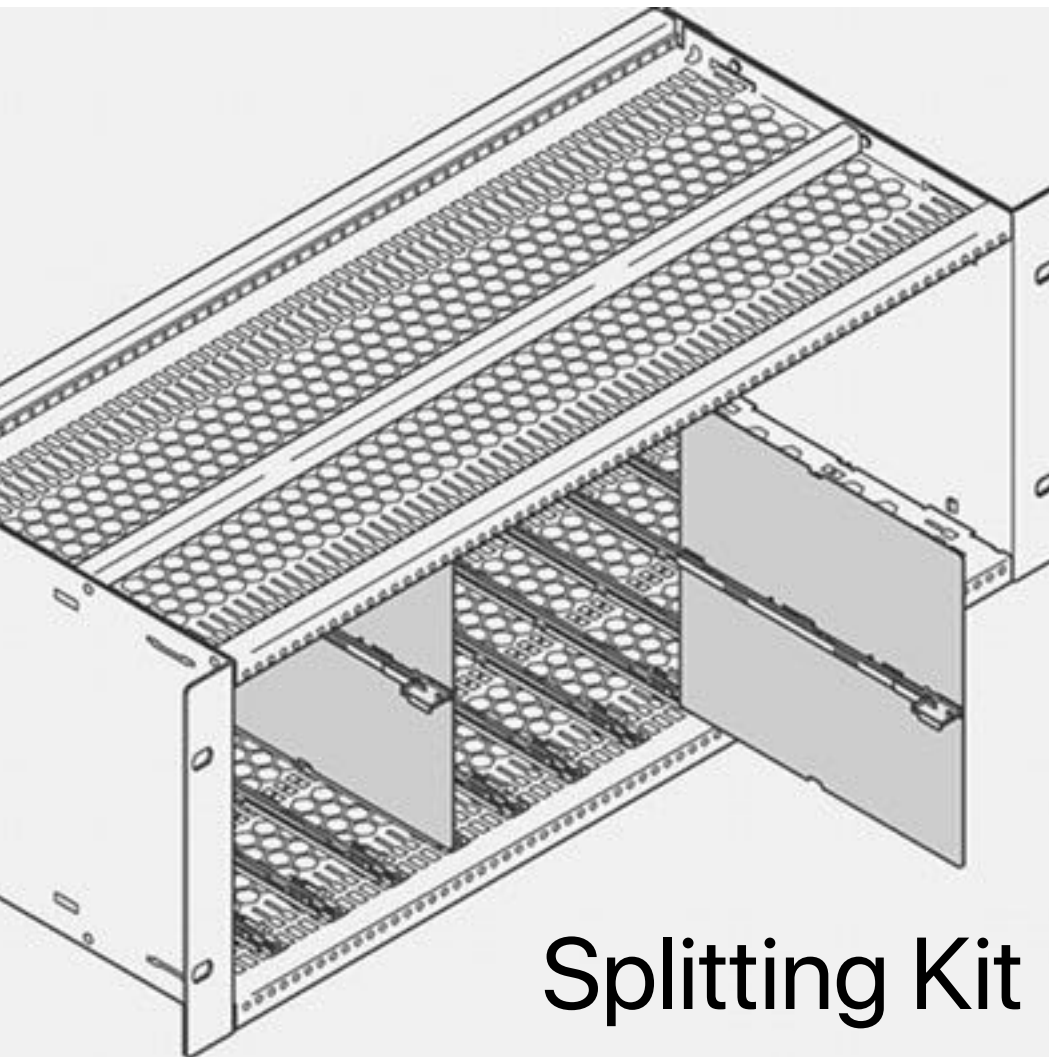
Compatibility of AMC Formats



Double Size

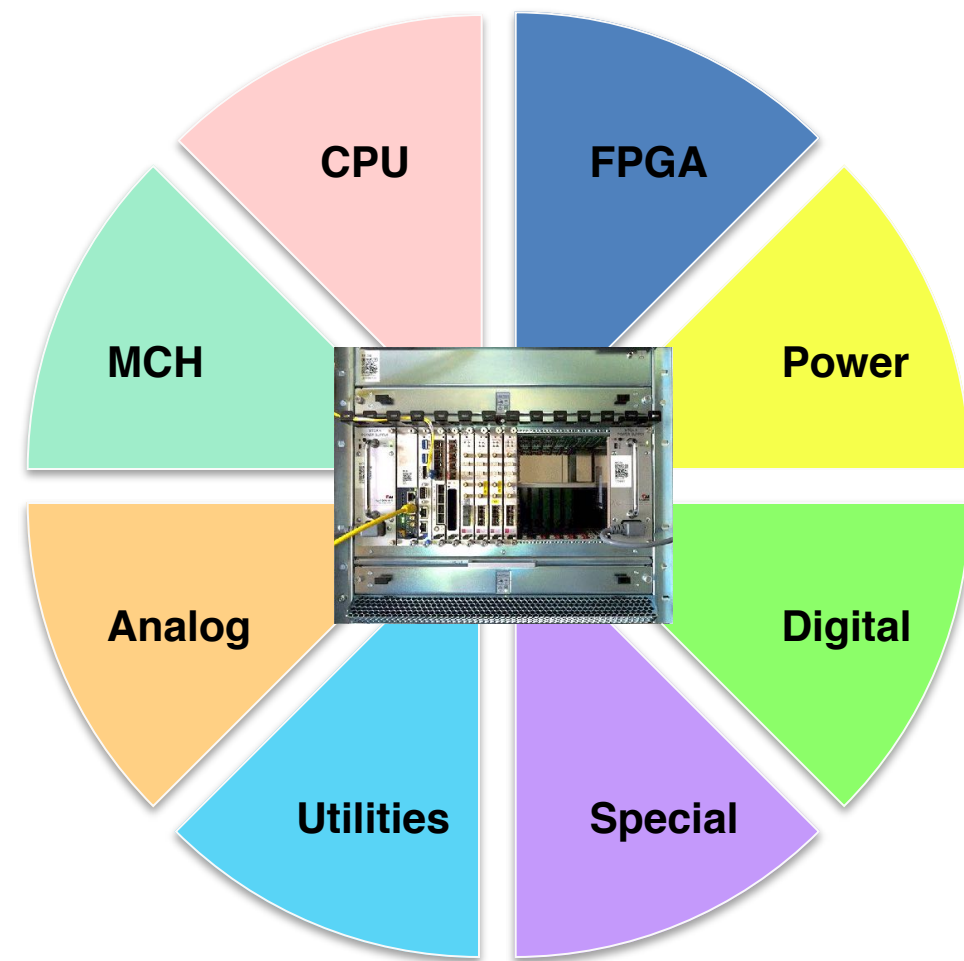


Single Size

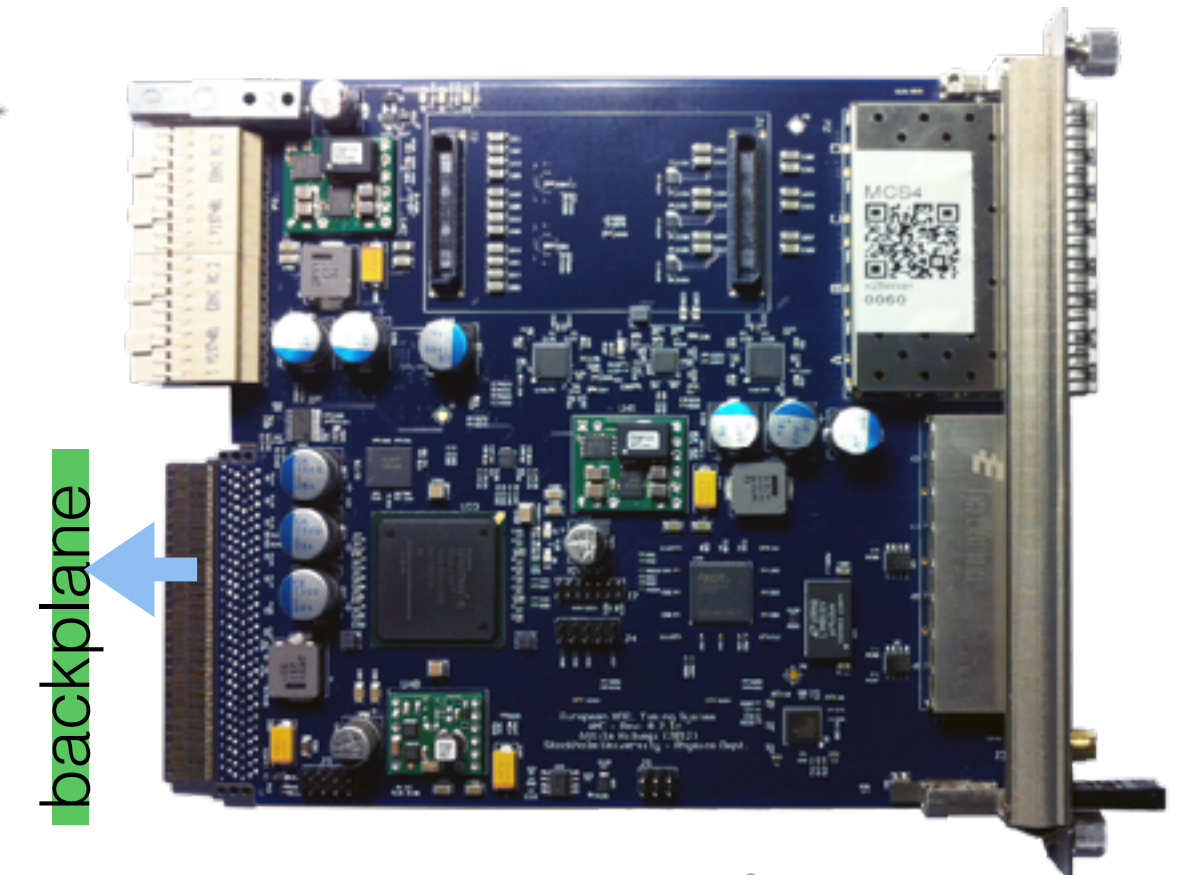
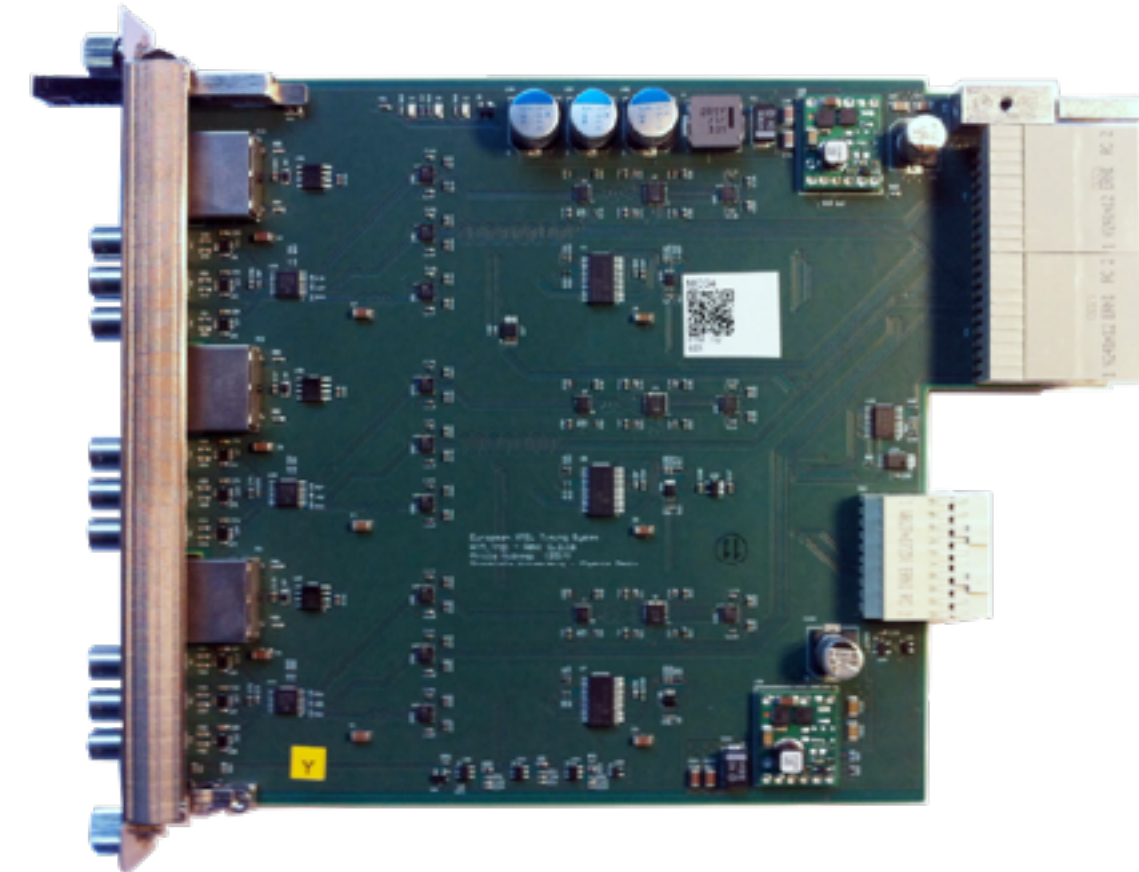


Splitting Kit

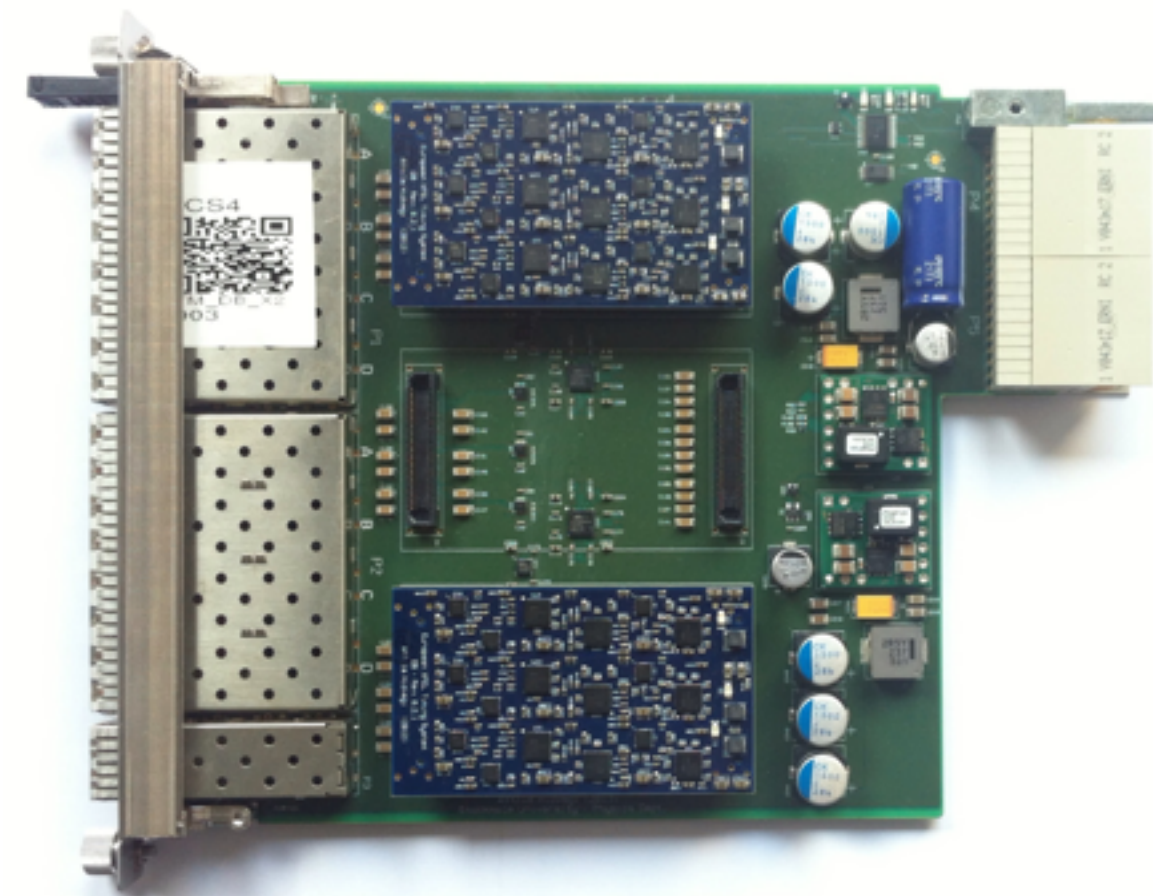
Modularity: AMC & RTM



RTM:
9 Lemo outputs



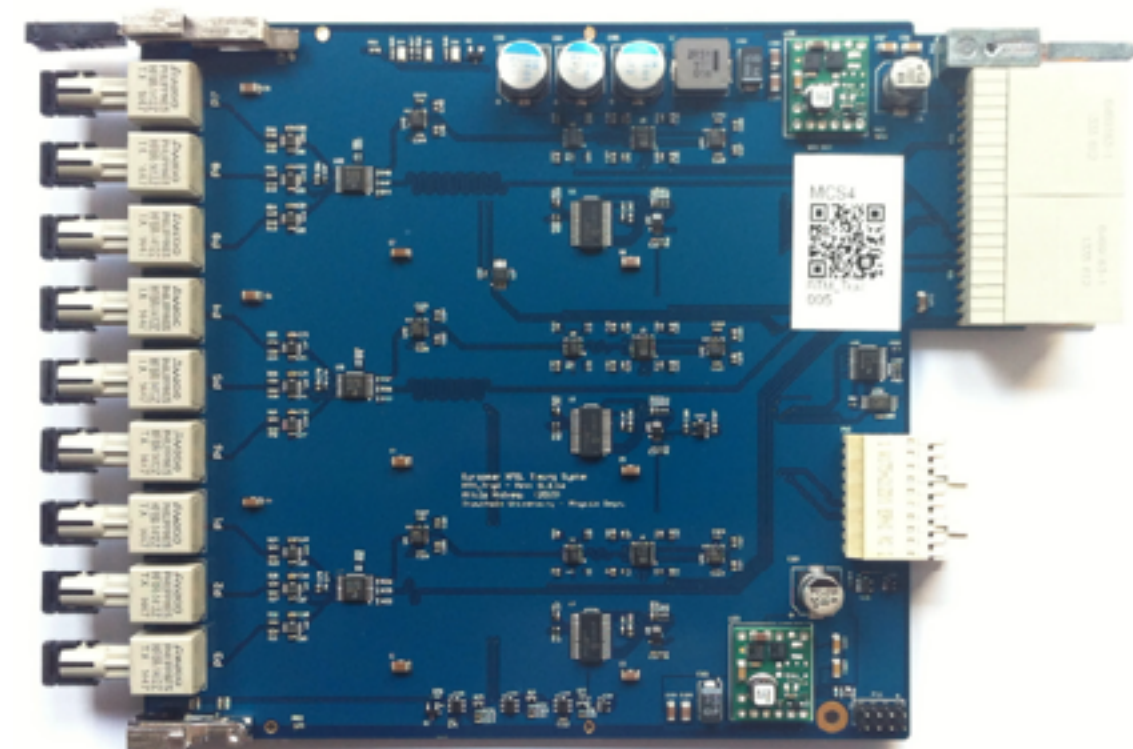
RTM:
Timing master
9 SFP outputs



AMC:

- Complex design
- FPGA, high-speed, ...

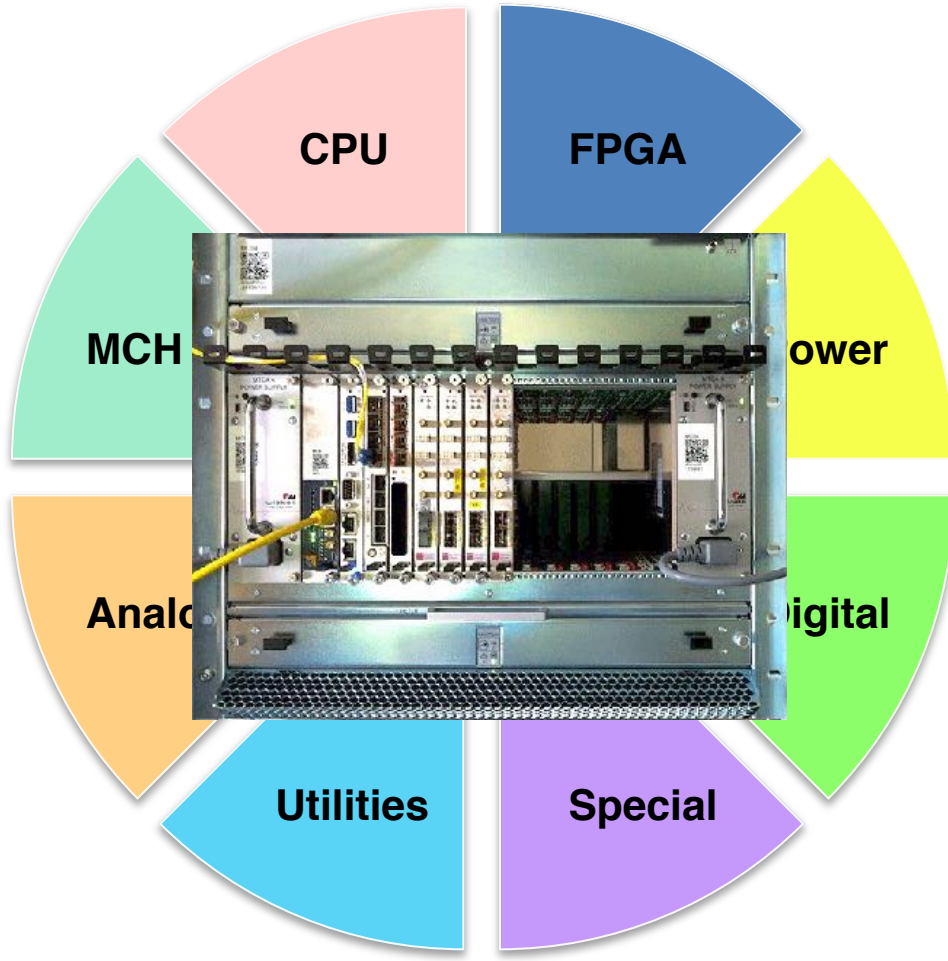
RTM:
Klystron interface
9 Fiber outputs (ST)



RTM:

- Simple design
- Cable adapter
- Signal conditioning

Crate / Shelf



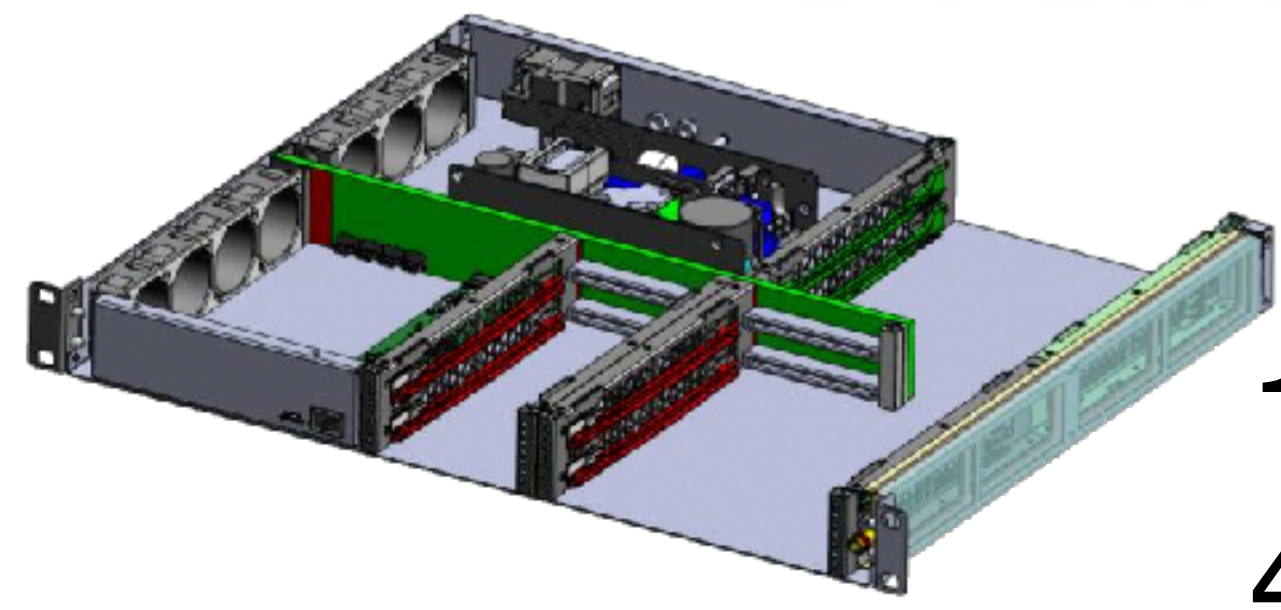
3 U
6 slots



9 U
12 slots



2 U
6 slots



1 U
4 slot

For development

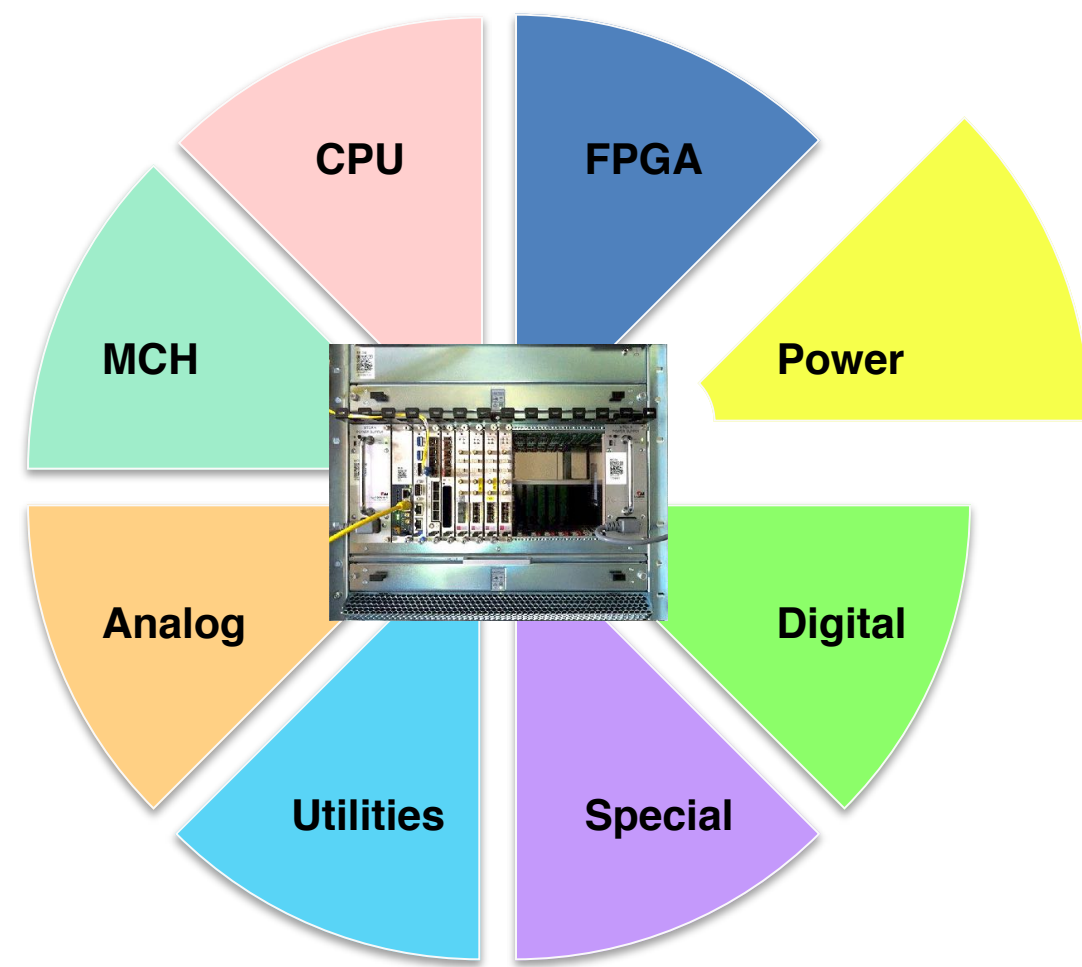
A photograph of a 5 U server rack with 7 slots. The front panel is silver with a perforated metal grille. The interior shows green circuit boards.

5 U
7 slots

A photograph of a 3 U server rack with 5 slots, single. The front panel is blue and white. The interior shows green circuit boards.

3 U
5 slots, single

Power Module



1000 W



600 W



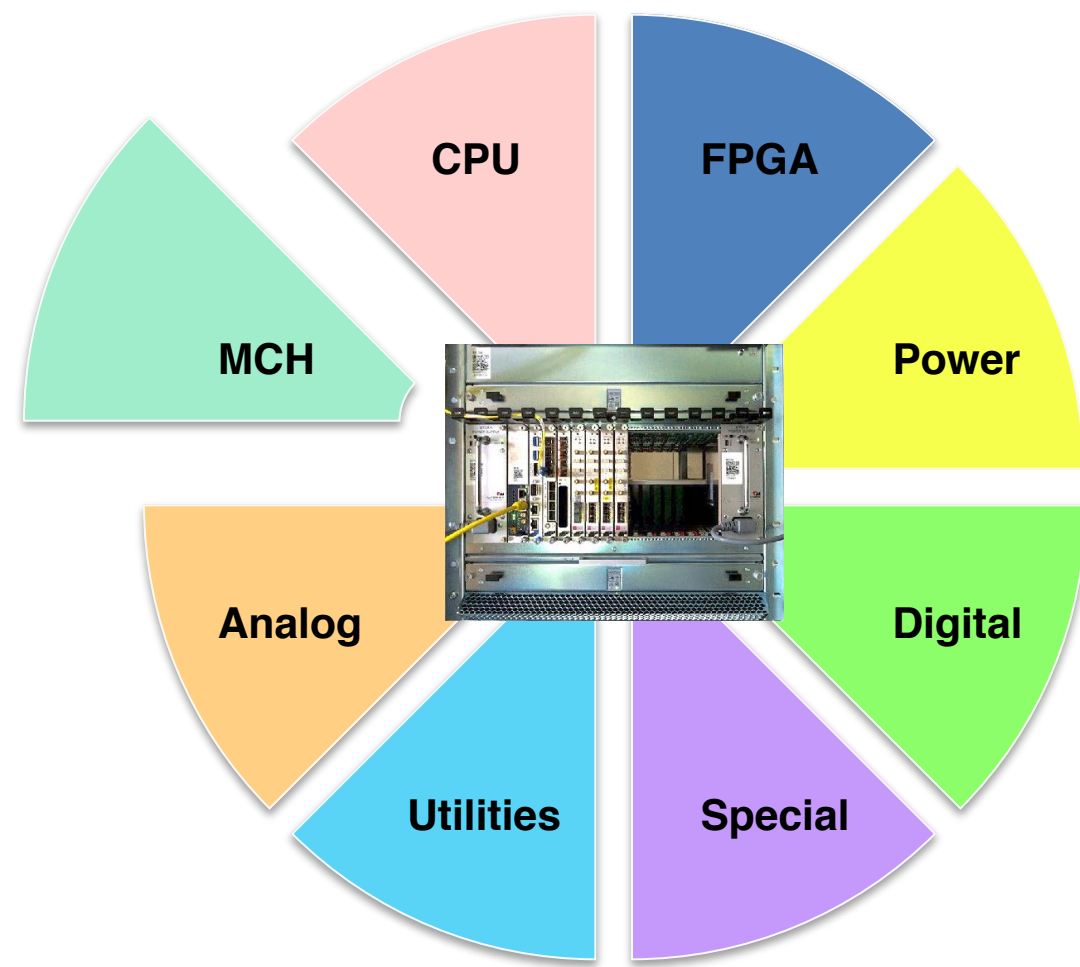
DC in

800 W



AC in

MicroTCA Carrier Hub



64 or 80 PCIe lanes



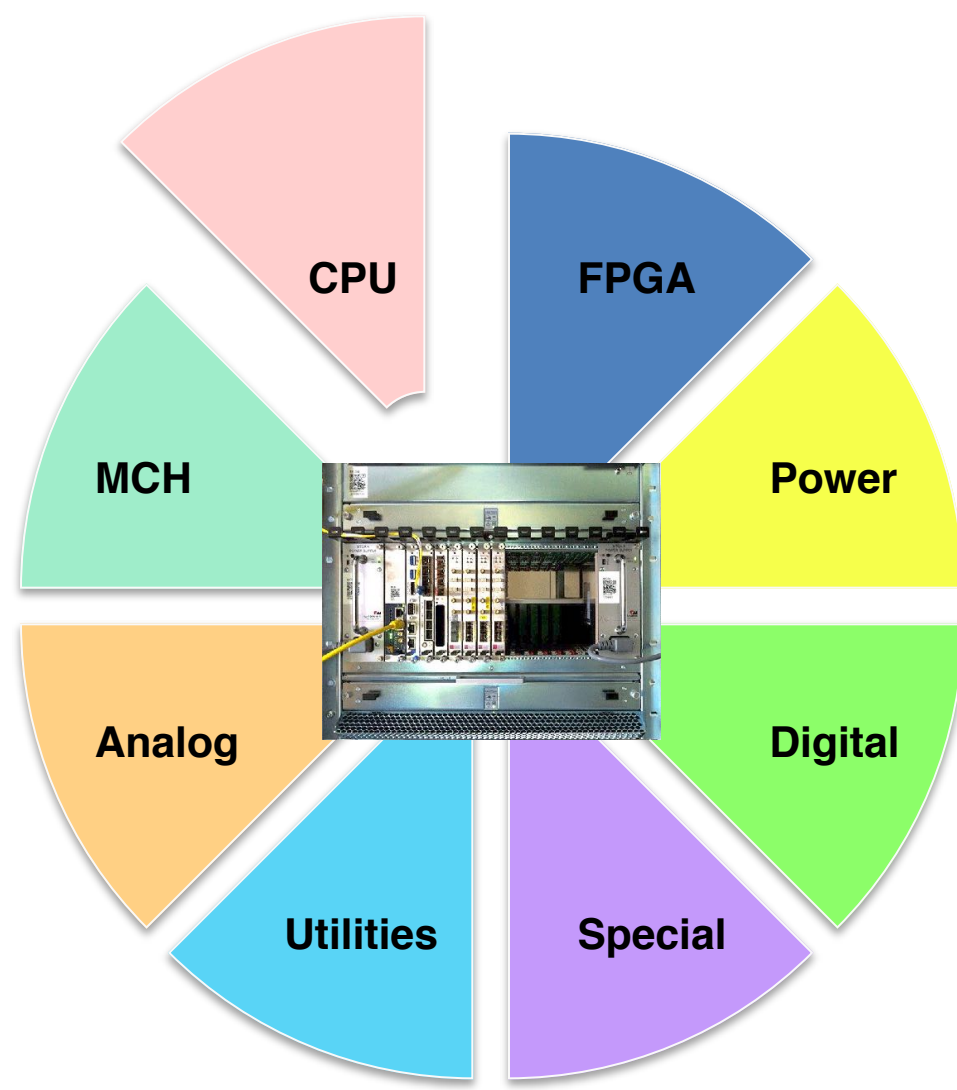
10 GbEthernet



MTCA.0



Embedded MCH
“just the basic management”



Intel 4-core Xeon
w/ dual SSD slot



Intel Xeon 3 GHz

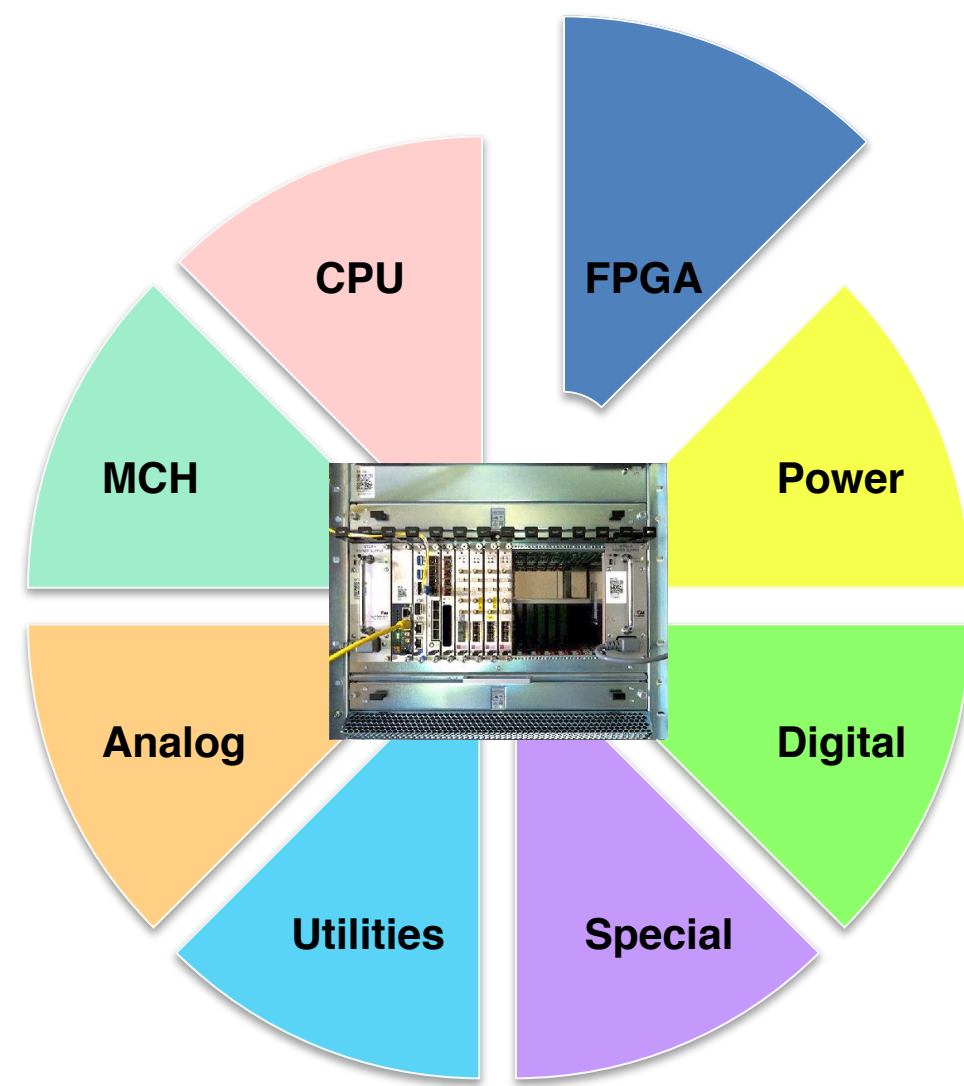


QorIQ Processor



8 DSPs

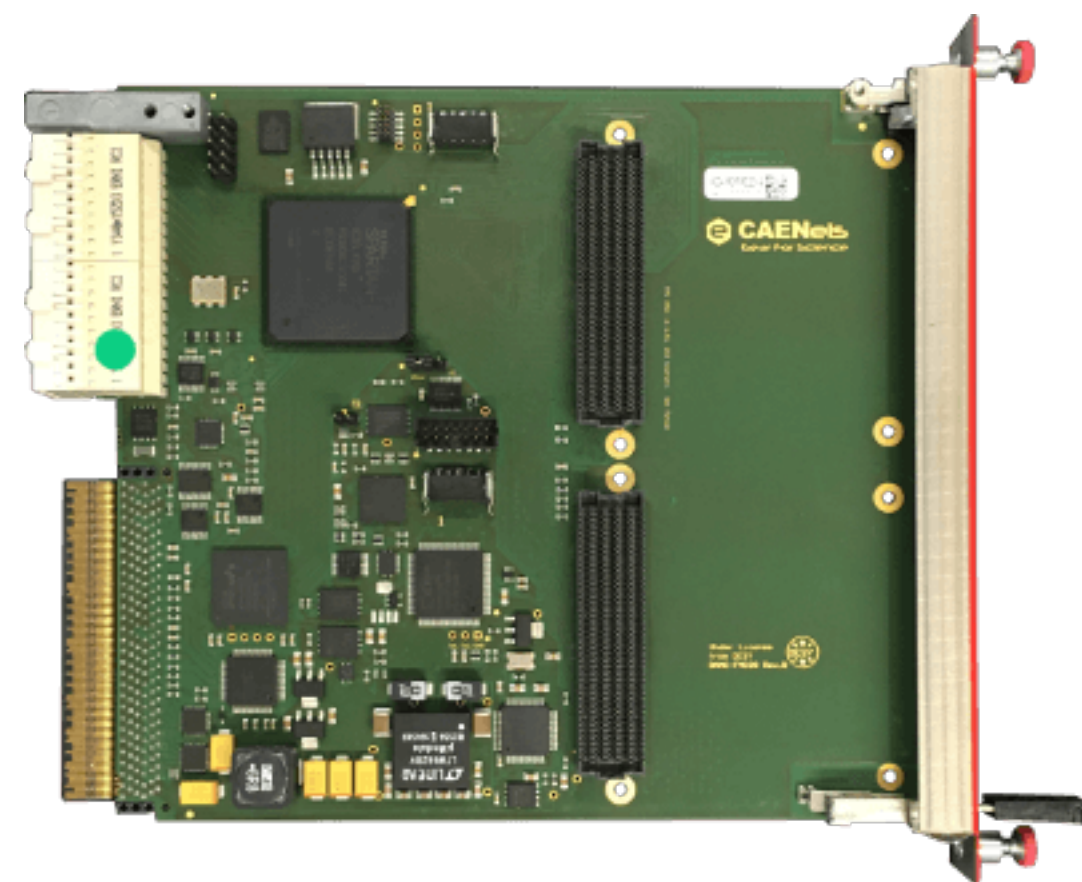
FPGA AMC



Kintex-7
8 * 10 Gbps SFP



Zynq UltraScale+
1968 DSP Slices, 1143k logic cells

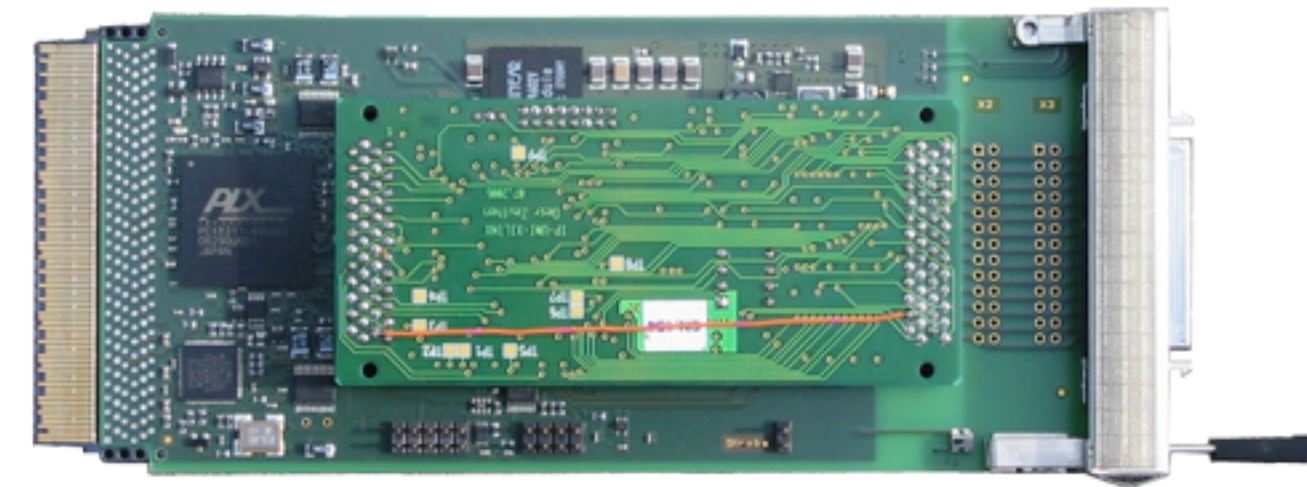
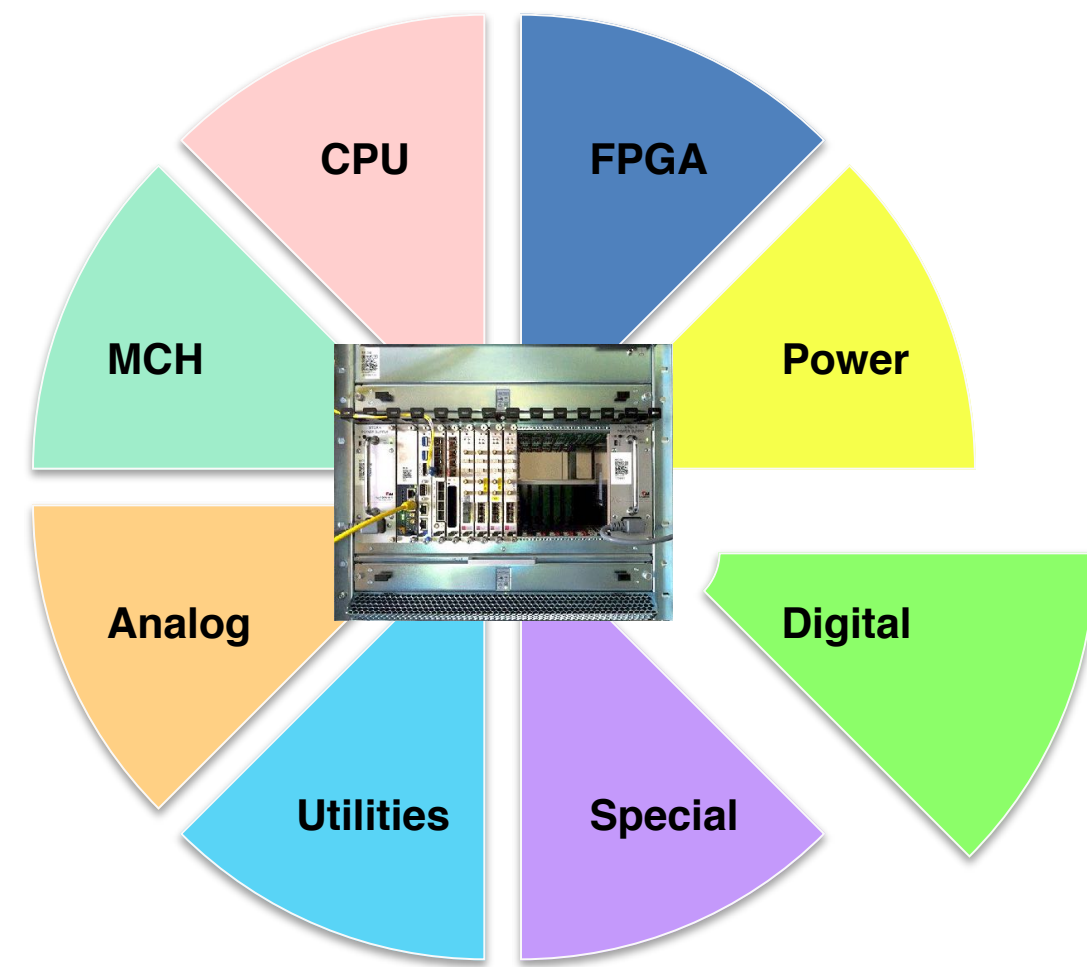


Spartan-6
2 FMC

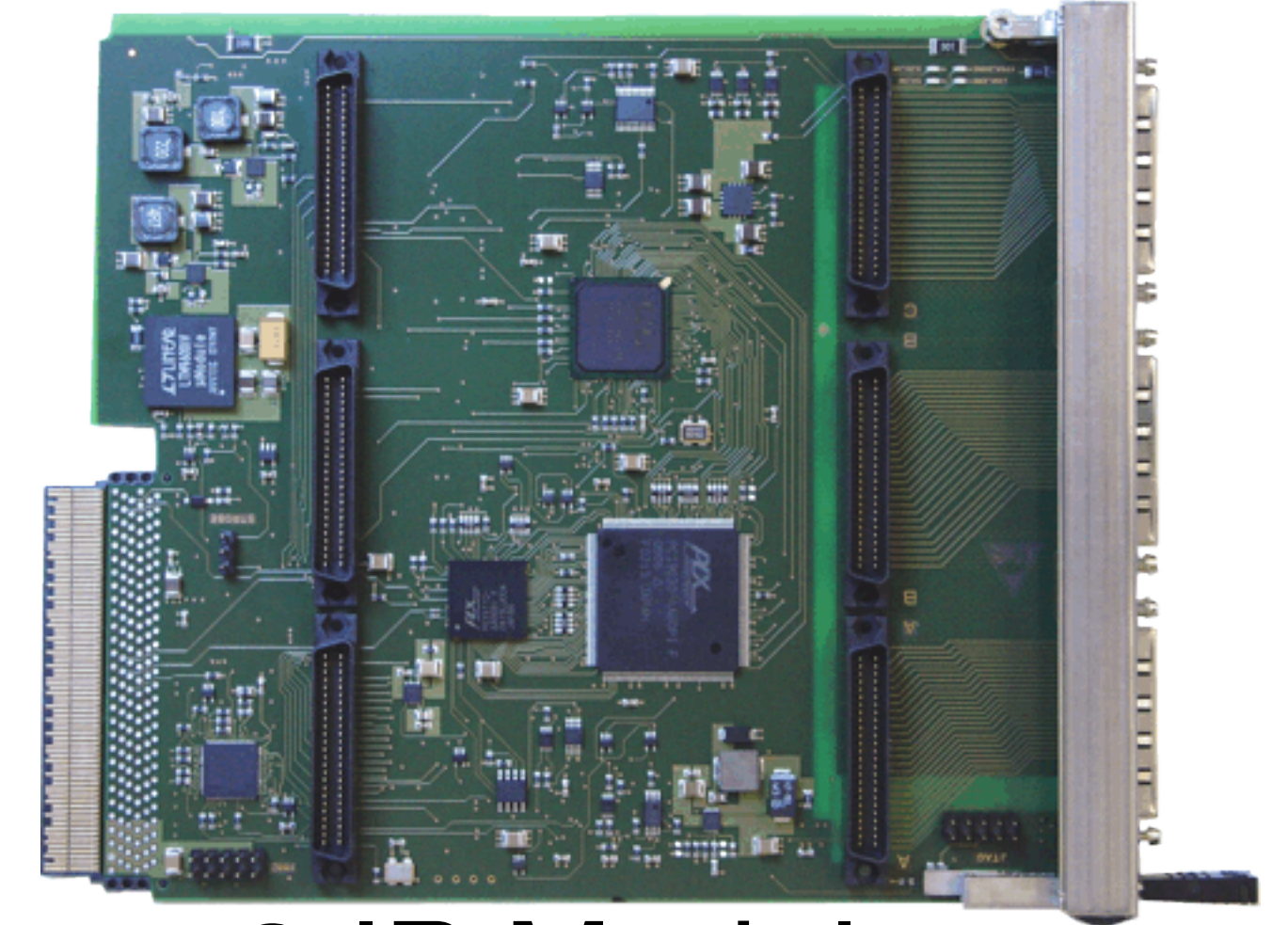


FMC
Many modules are available

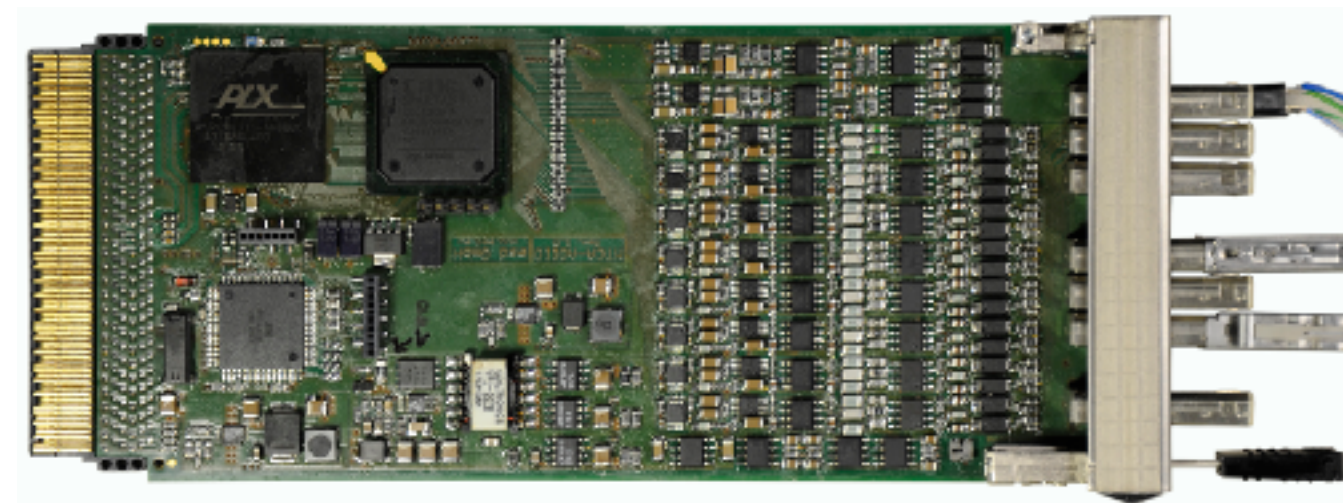
Digital AMC



1 IP Module
Carrier

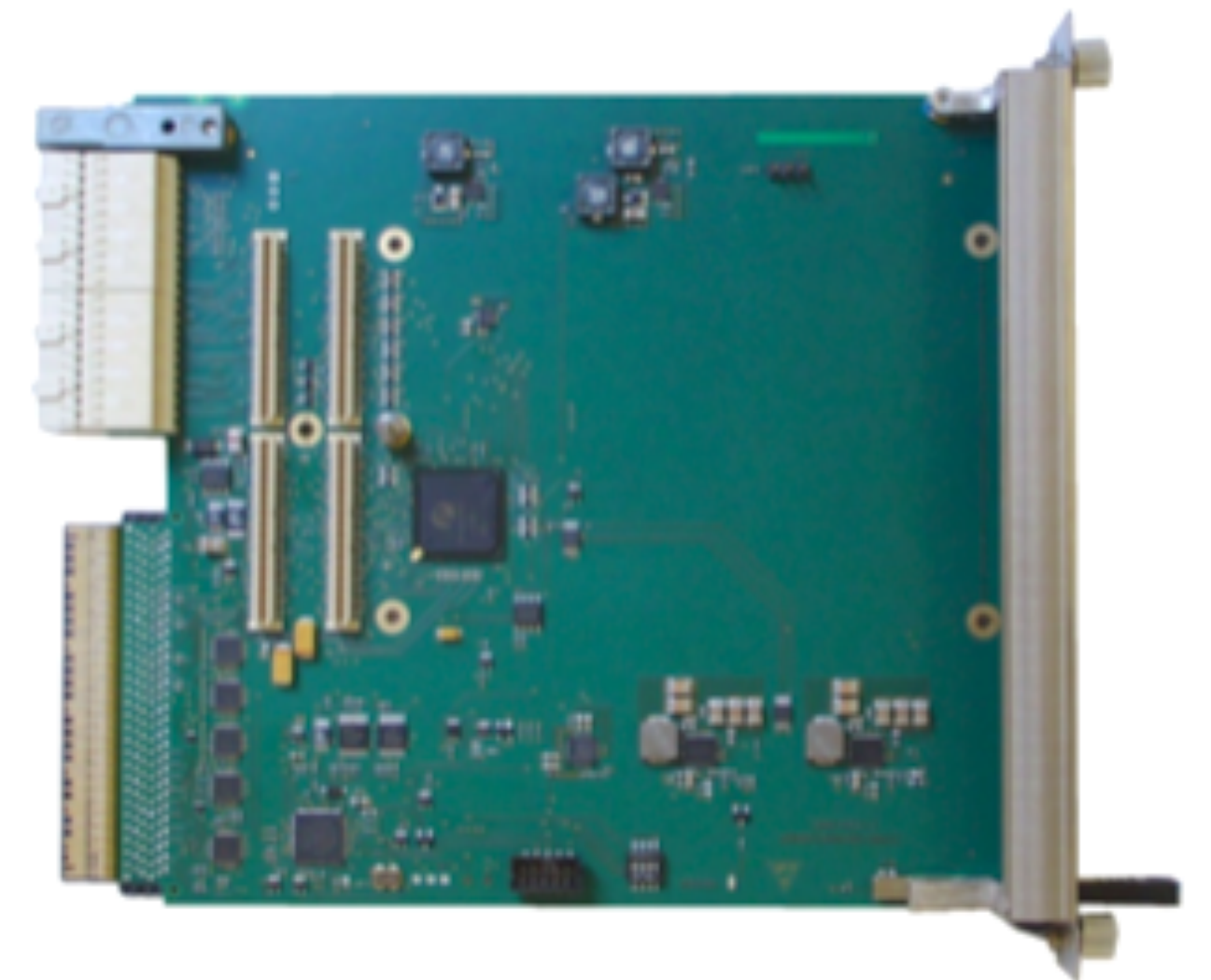


3 IP Module
Carrier

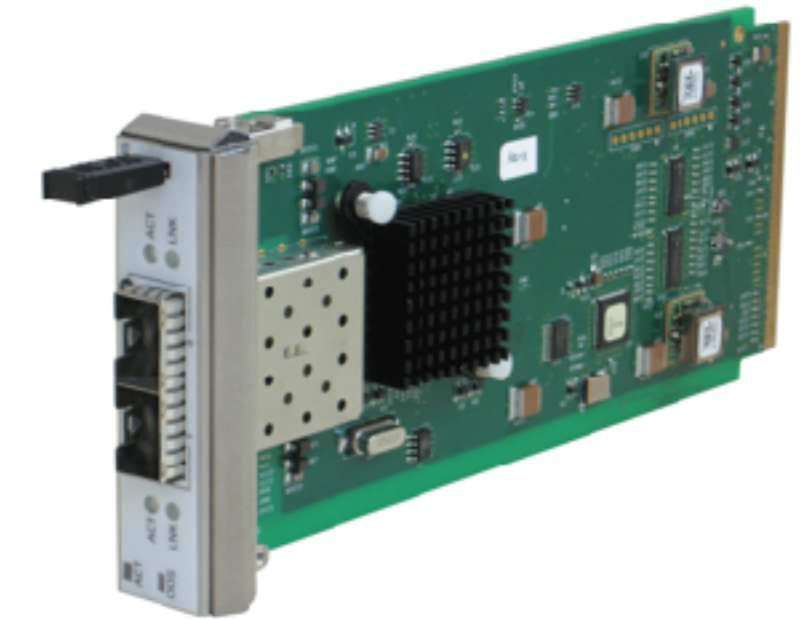
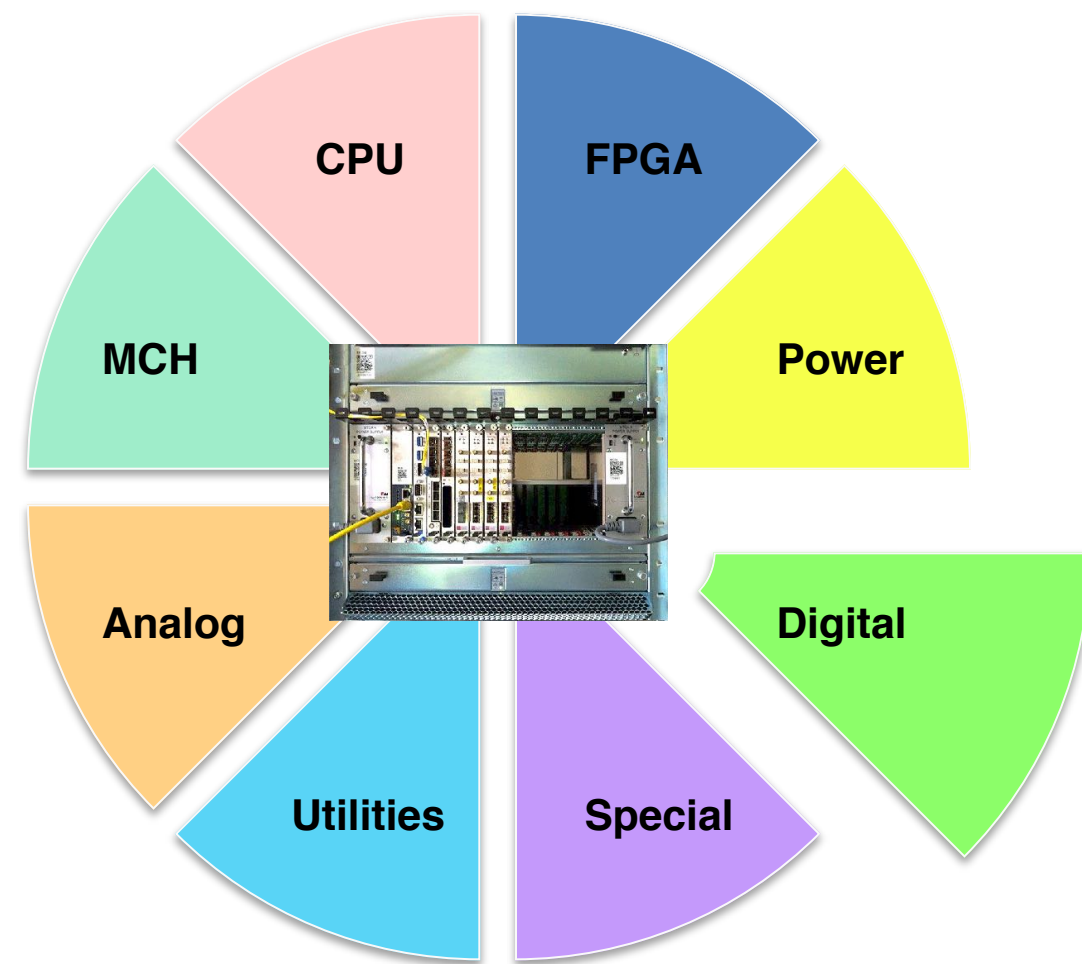


24 Digital I/O
8 ADCs 16 bit

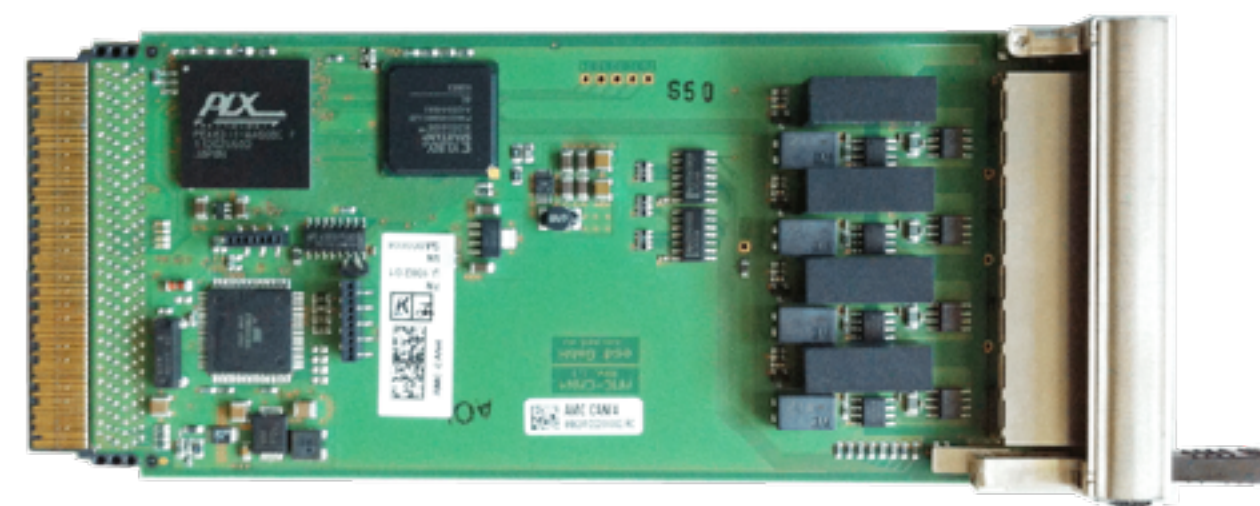
PMC Module
Carrier



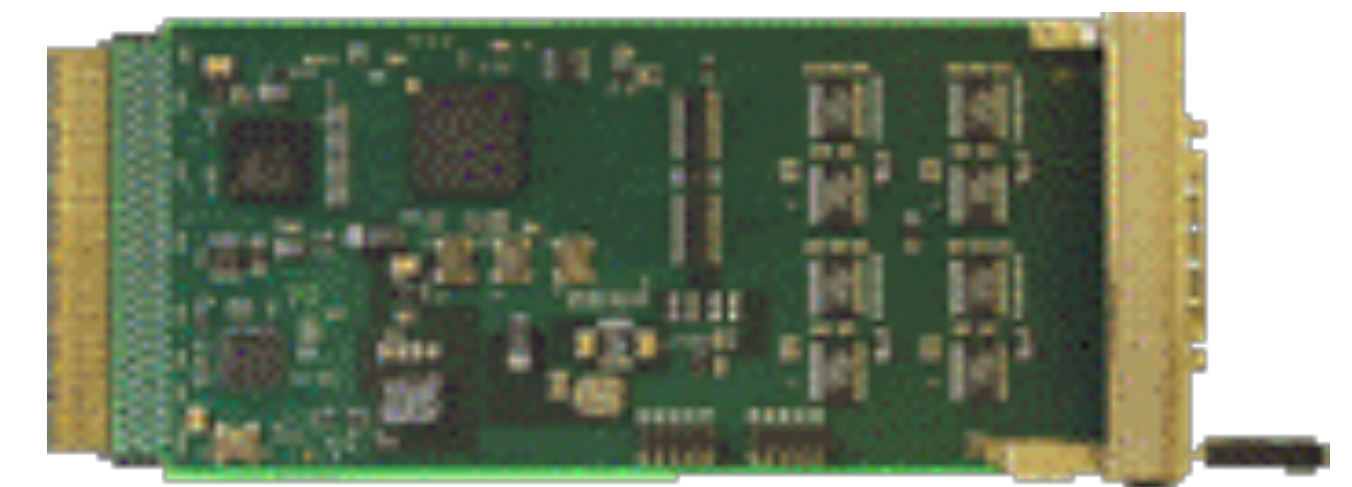
Digital AMC



Ethernet Switch, up to 16 ports
10, 100, 1000BaseT ... 10 Gigabit

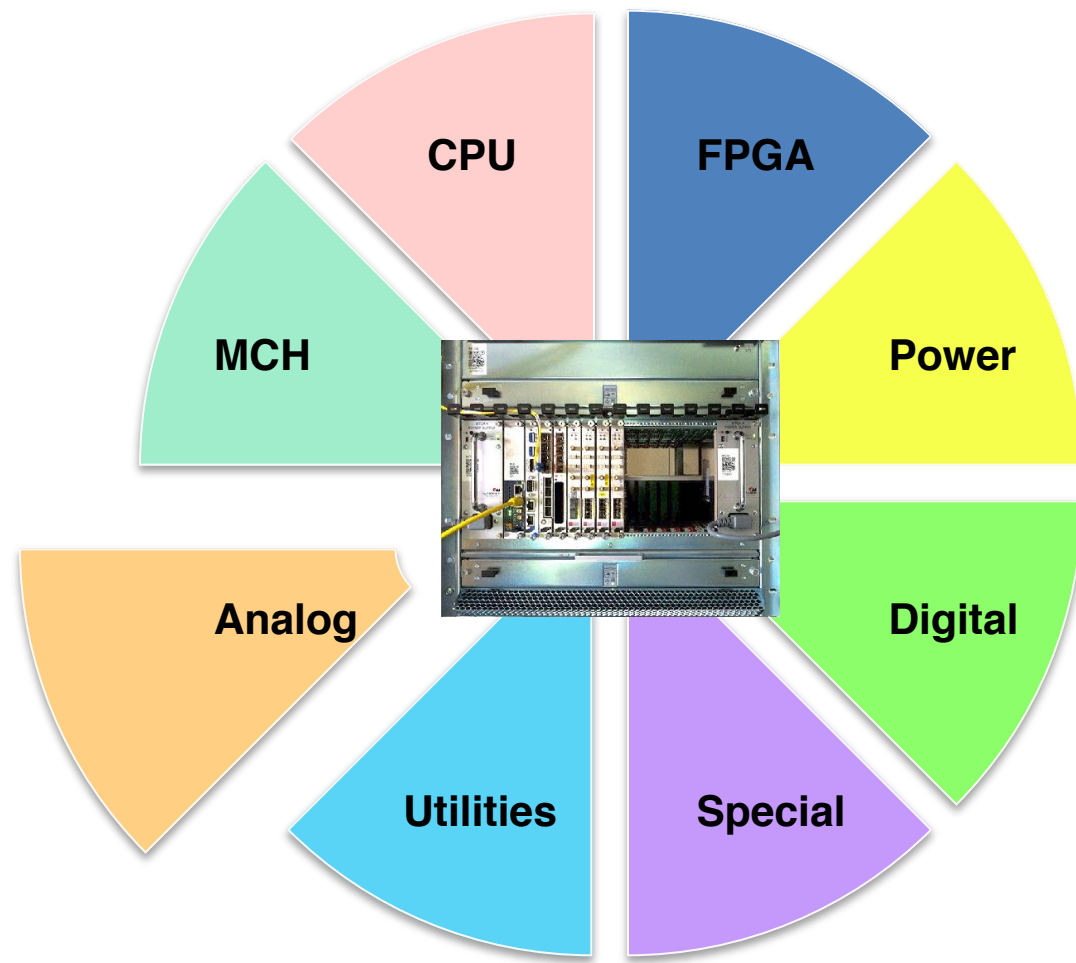


CAN Bus
4 channels

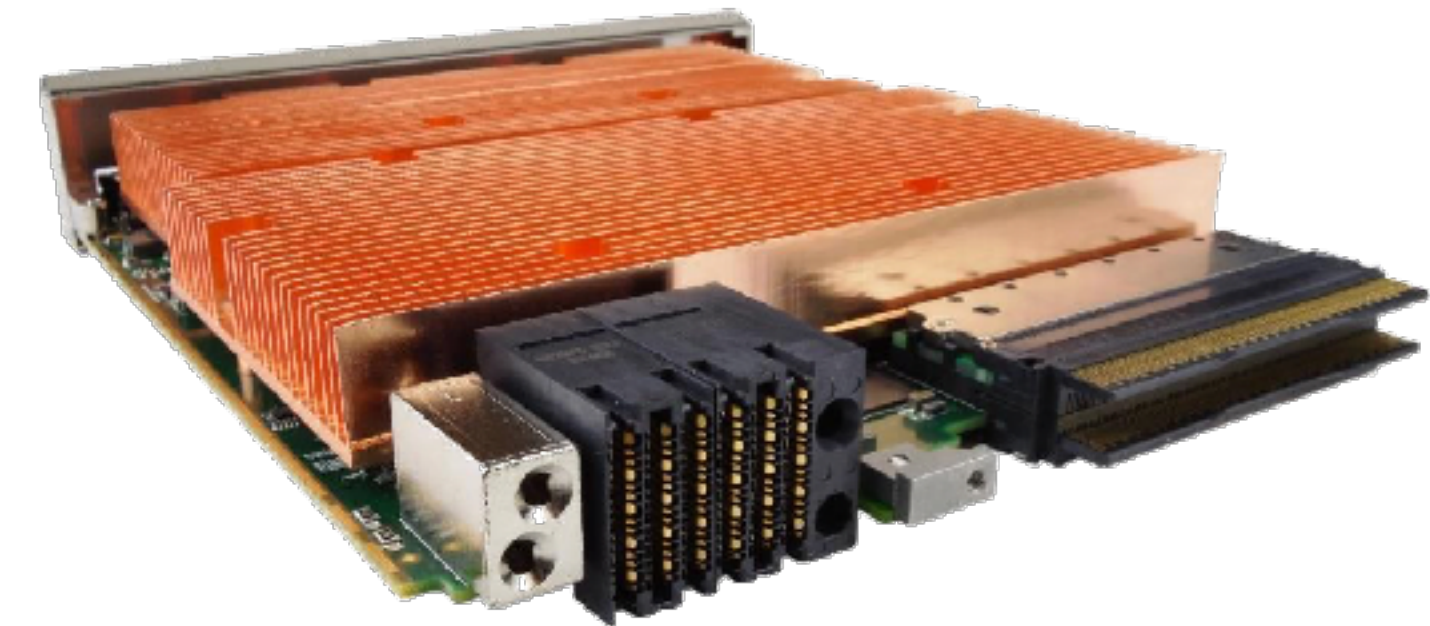


Serial RS 232 / 422
4 channels

Analog AMC



1 ... 10 GSPS
10 ... 14 bit
1, 2, 4 ch.



26 / 56 GSPS
8 bit
4 / 2 ch.



125 / 250 MSPS
16 bit
10 ch.

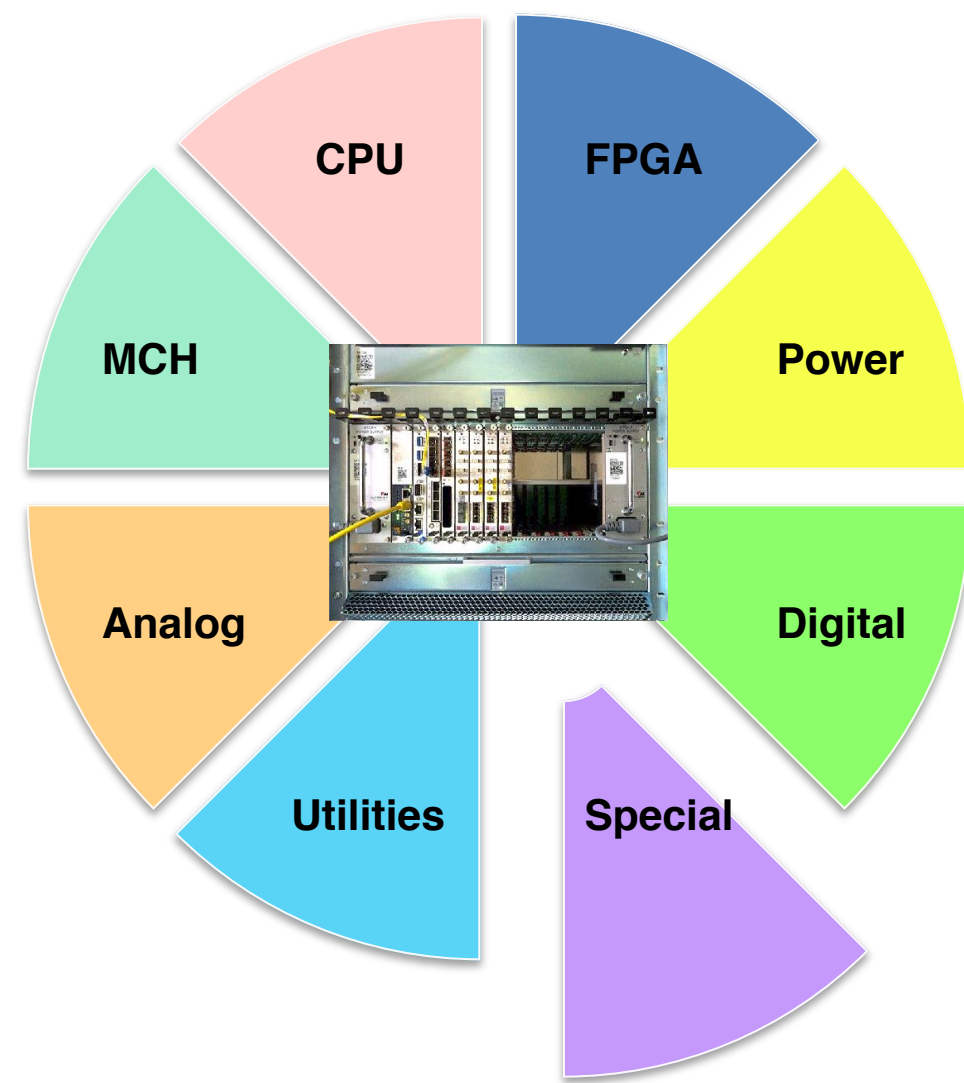


50 / 75 MSPS
12 / 14 bit
32 ch.

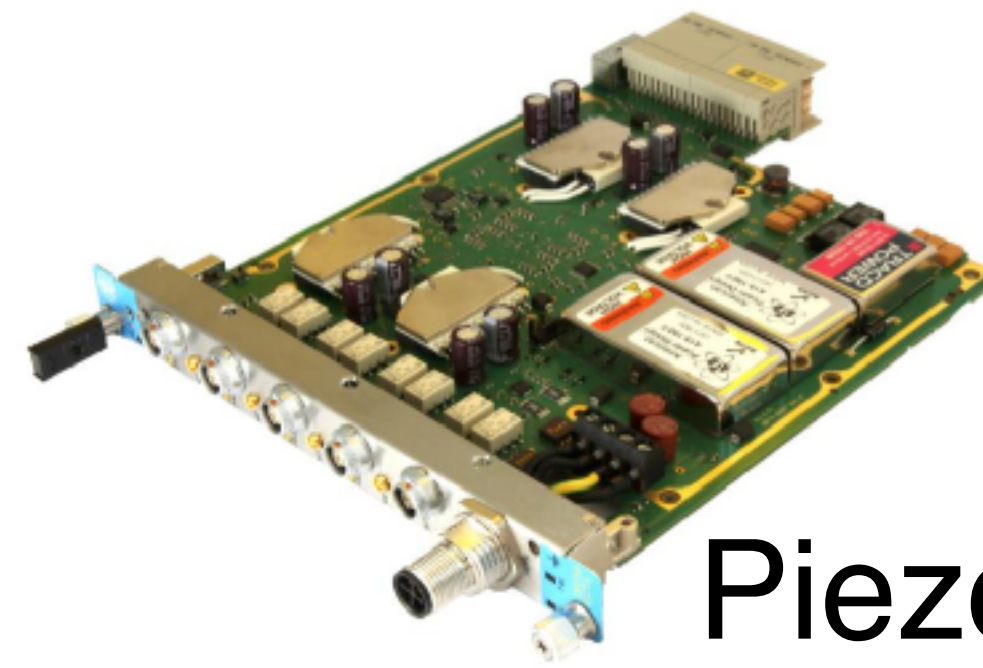


20 bit Picoammeter
8 ch.

Special Function



Scaler
16/32 channels



Piezo Driver
RTM

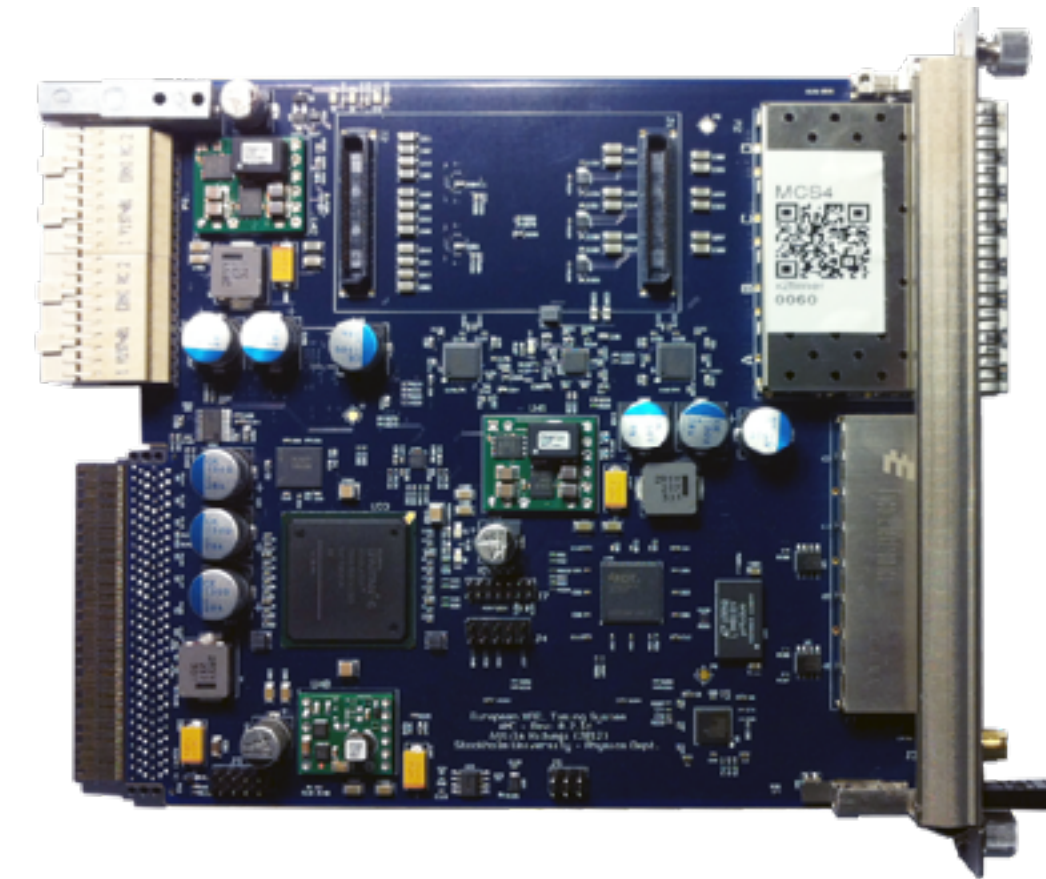
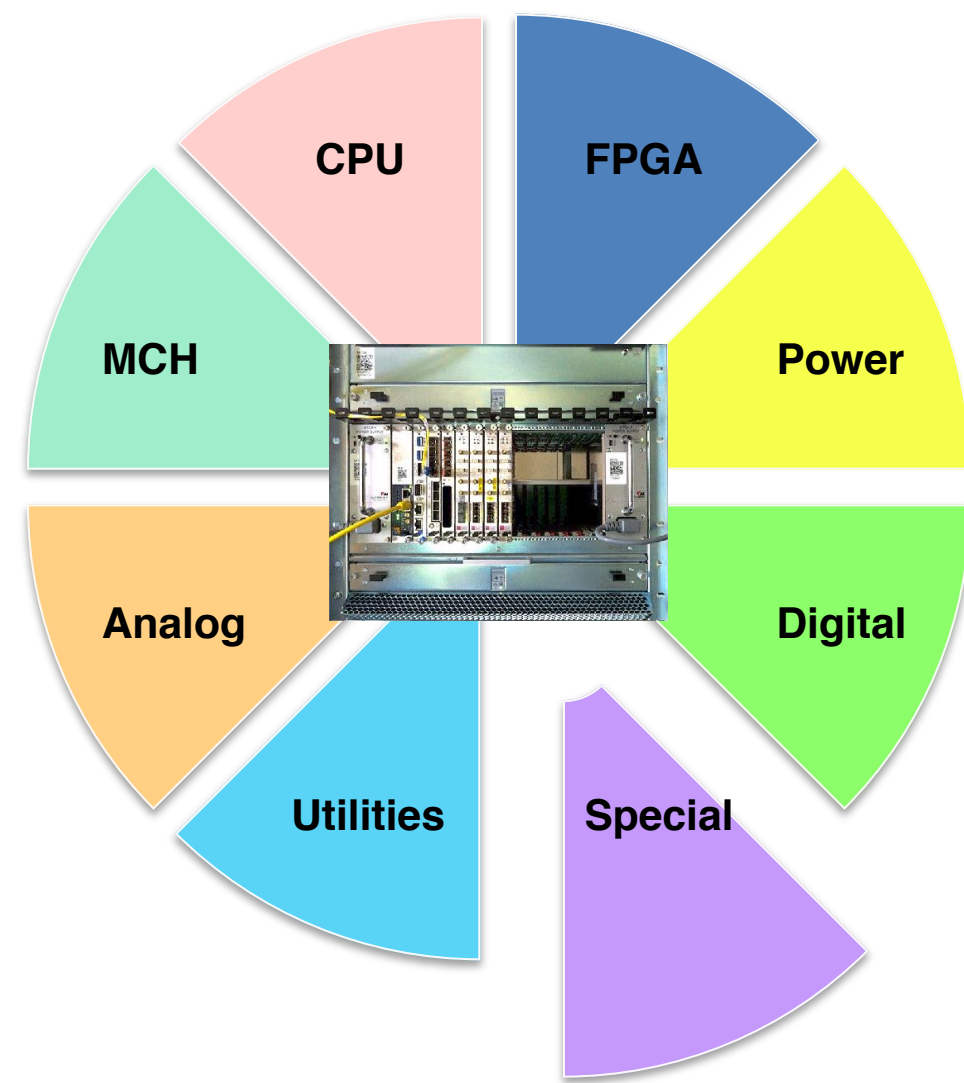


4 channels HV
... 6 kV

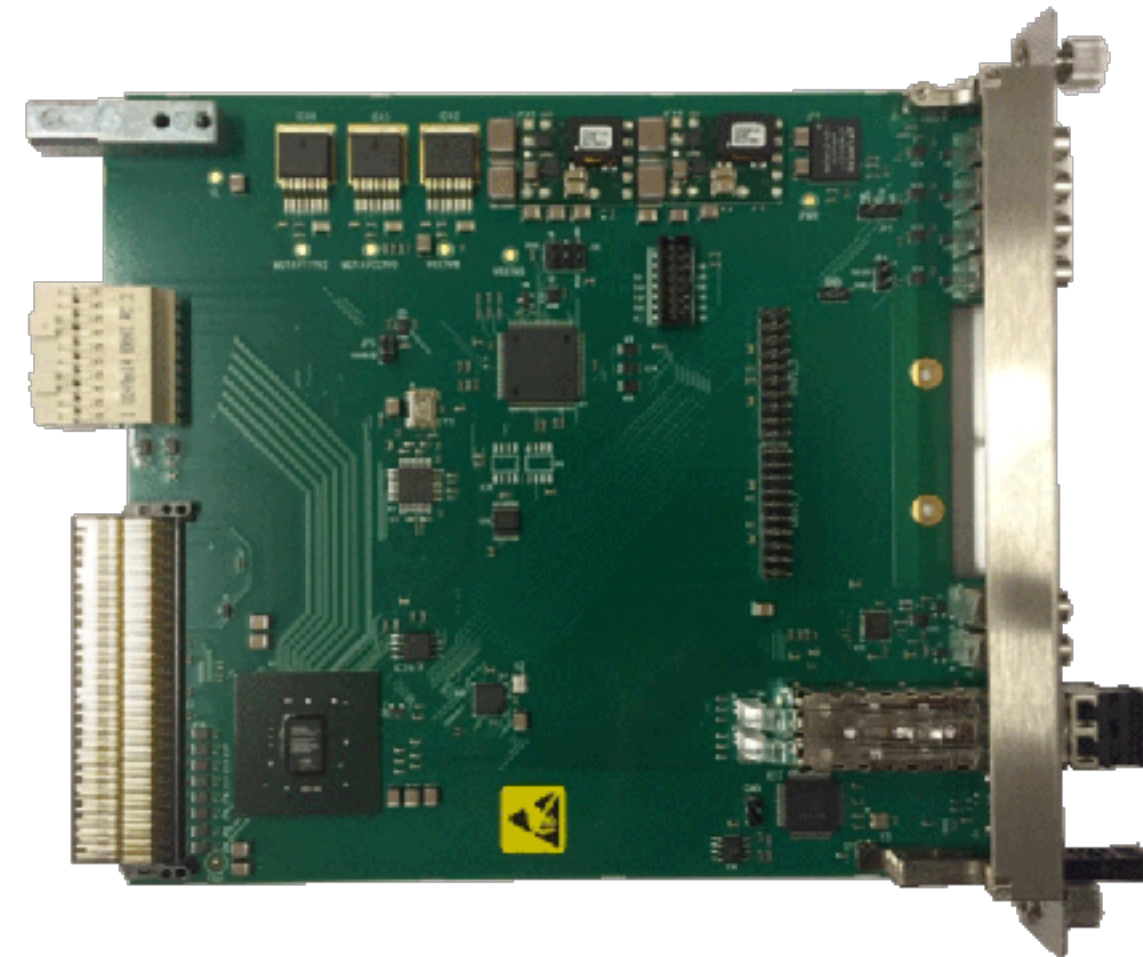


2,5" SATA
SSD or HDD

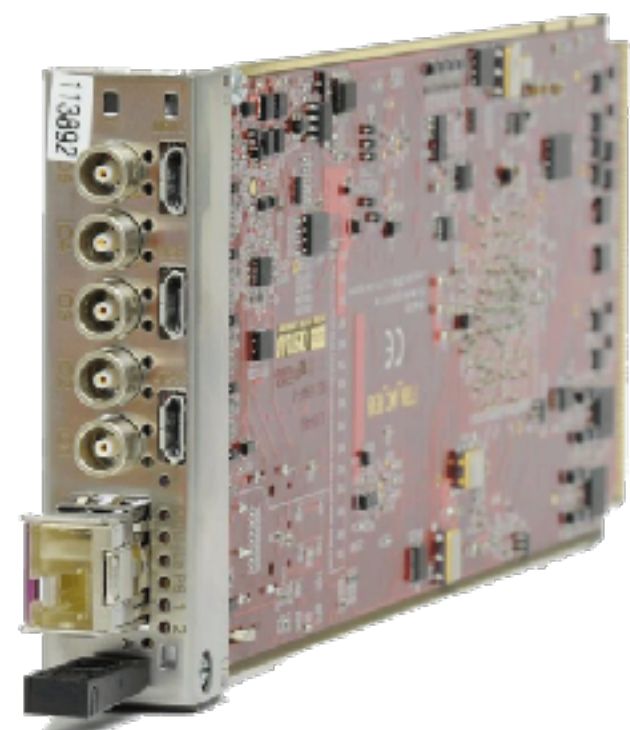
Special Function: Timing



XFEL Timing

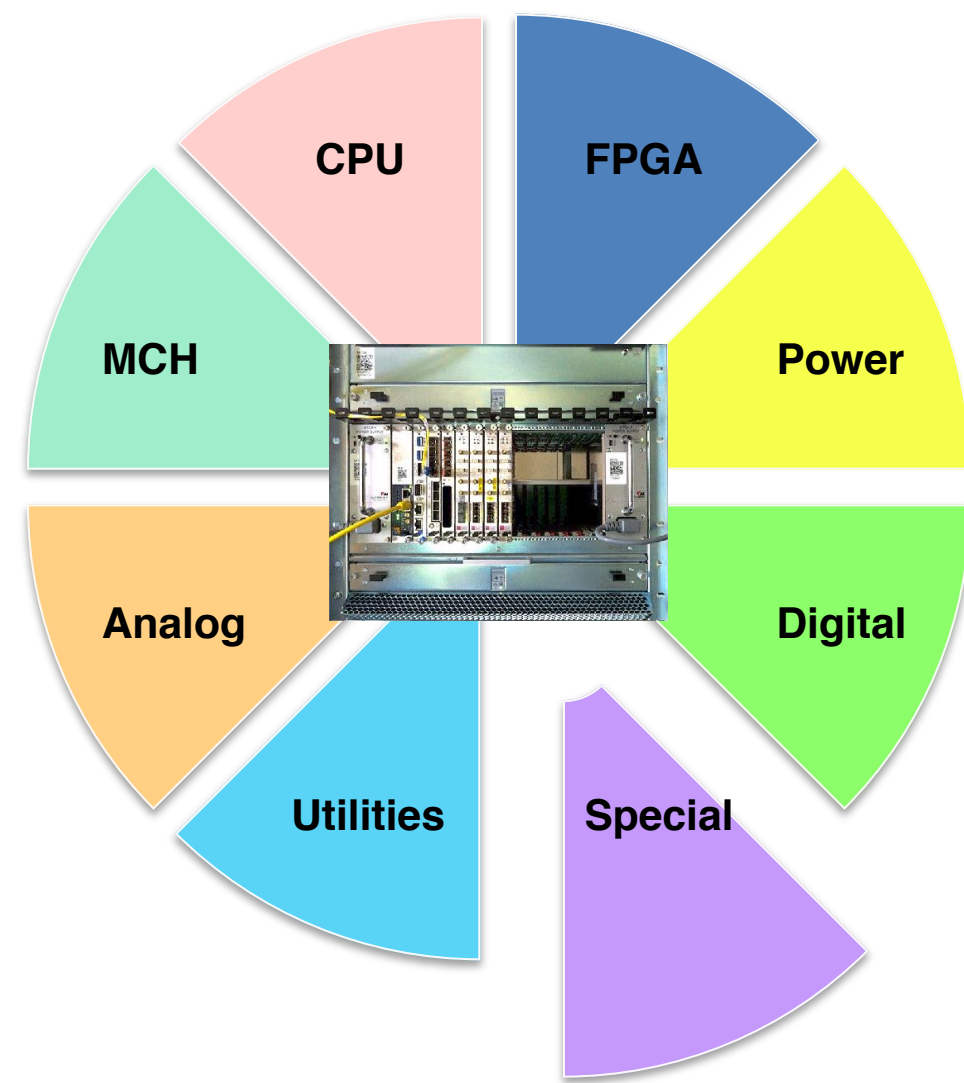


MRF Timing



WhiteRabbit Timing

Special Function



GigE Vision
Image processing

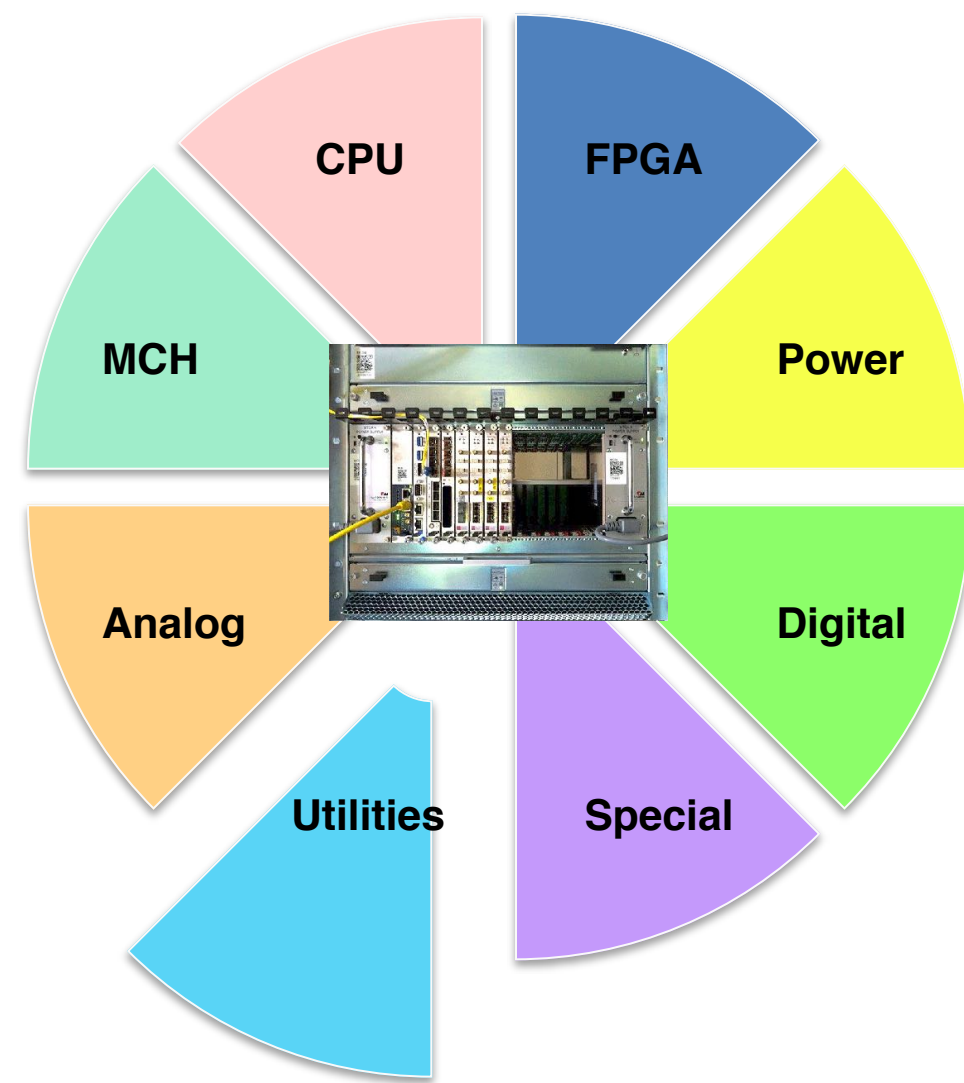


Frame Grabber



Graphic Controller

Helper & Utility



Load modules

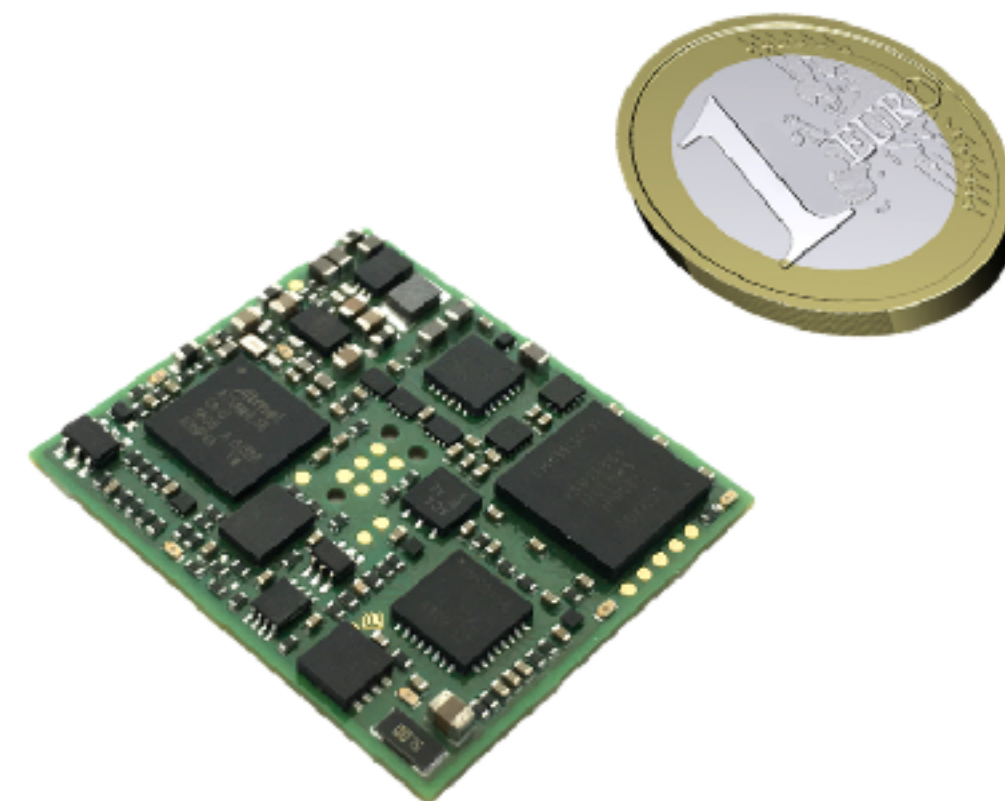


Filler modules

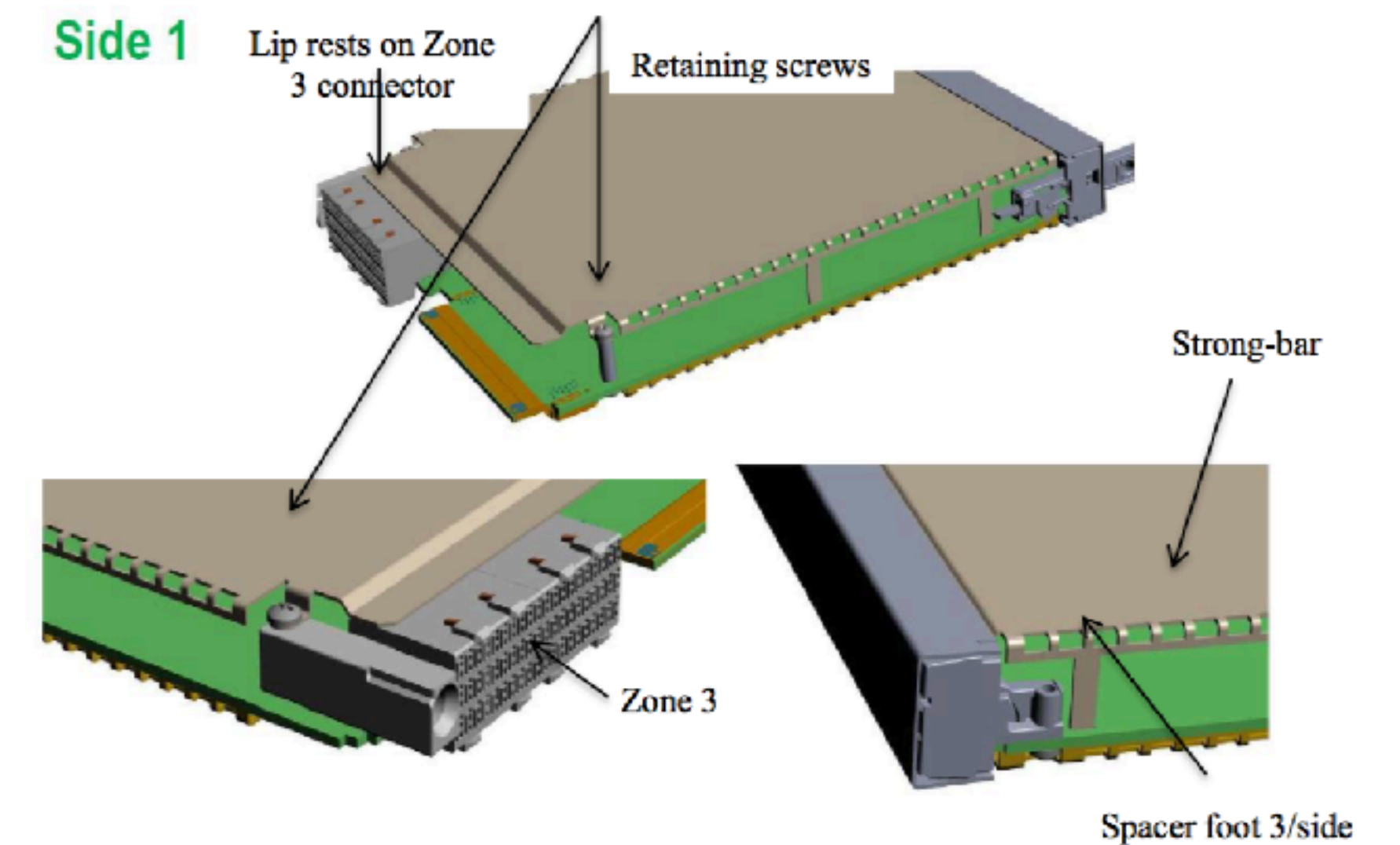
Protection Cover: AMC, RTM



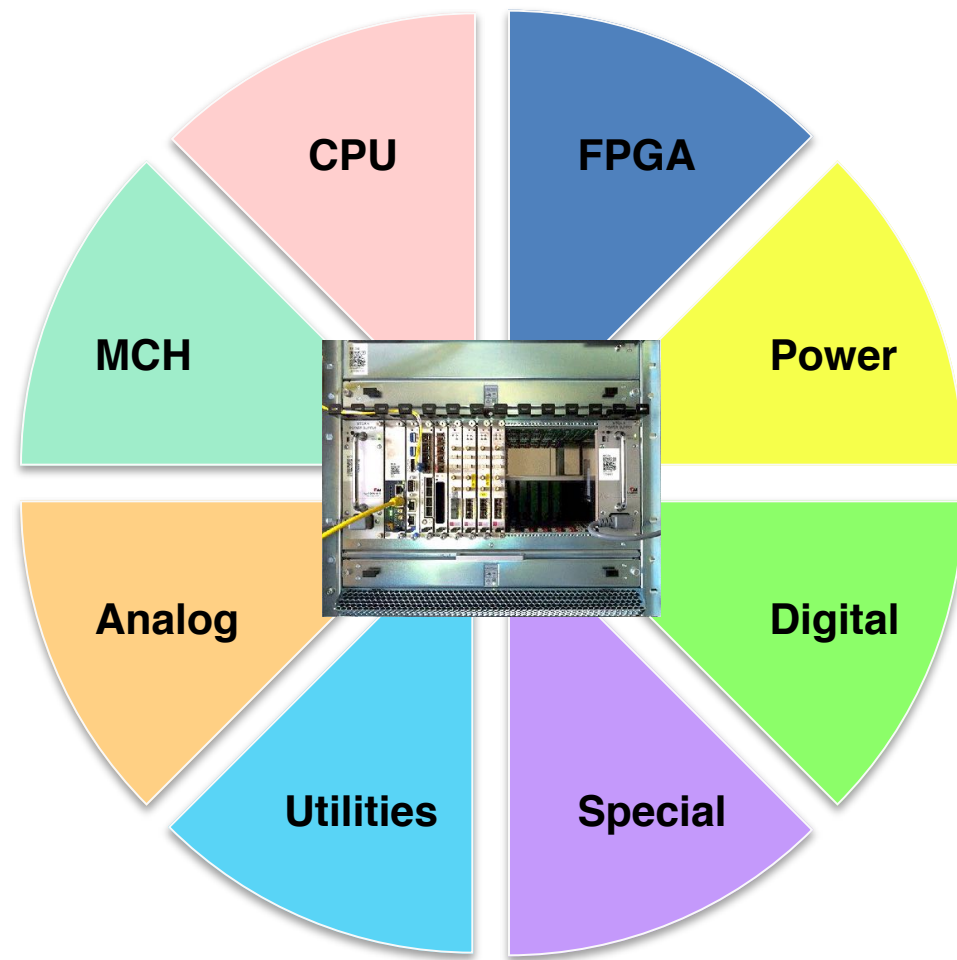
Extender for
AMC & RTM



MMC on module



Links to Products



© of images and products:

CAENels

<https://www.caenels.com>

Concurrent

<https://www.gocct.com>

Cosylab

<https://www.cosylab.com>

DMCS

<https://www.dmcs.pl/en/home>

Elma

<https://www.elma.com>

ESD

<https://esd.eu/>

N.A.T

<https://www.nateurope.com>

nVent / Schroff

<https://schroff.nvent.com>

SANBlaze

<https://www.sanblaze.com>

SP Devices

<https://spdevices.com>

Struck

<https://www.struck.de>

TechLab

<https://techlab.desy.de>

Tews

<http://www.tews.com>

Vadatech

<https://www.vadatech.com>

Wiener

<http://www.wiener-d.com>