

Interface Electronics



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DESY-FEB

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- > Status of boards, numbers available
- > Number of boards
- > Status of firmware(μ C)
- > Integration

Analogue mother board:

- 3 in hand with old gain
- 17 in hand with up-to-date gain

Analogue daughter

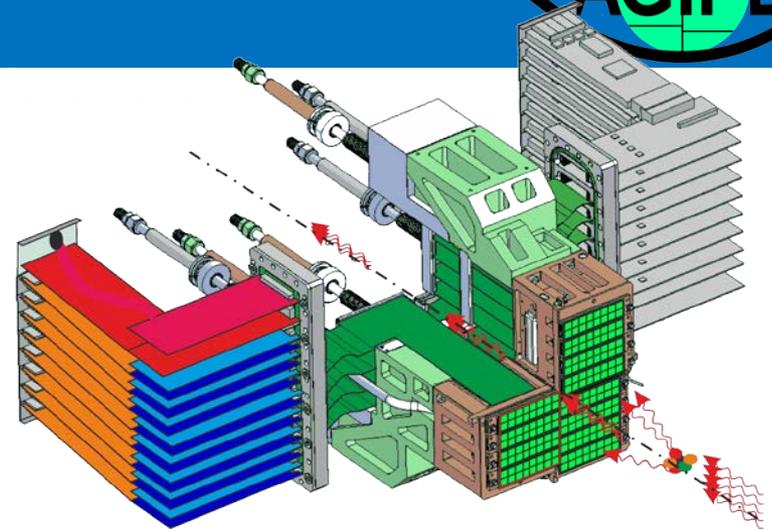
- 23 in hand

2 slot backplanes

12 in hand (basic tests)

8 slot backplanes

7 in hand

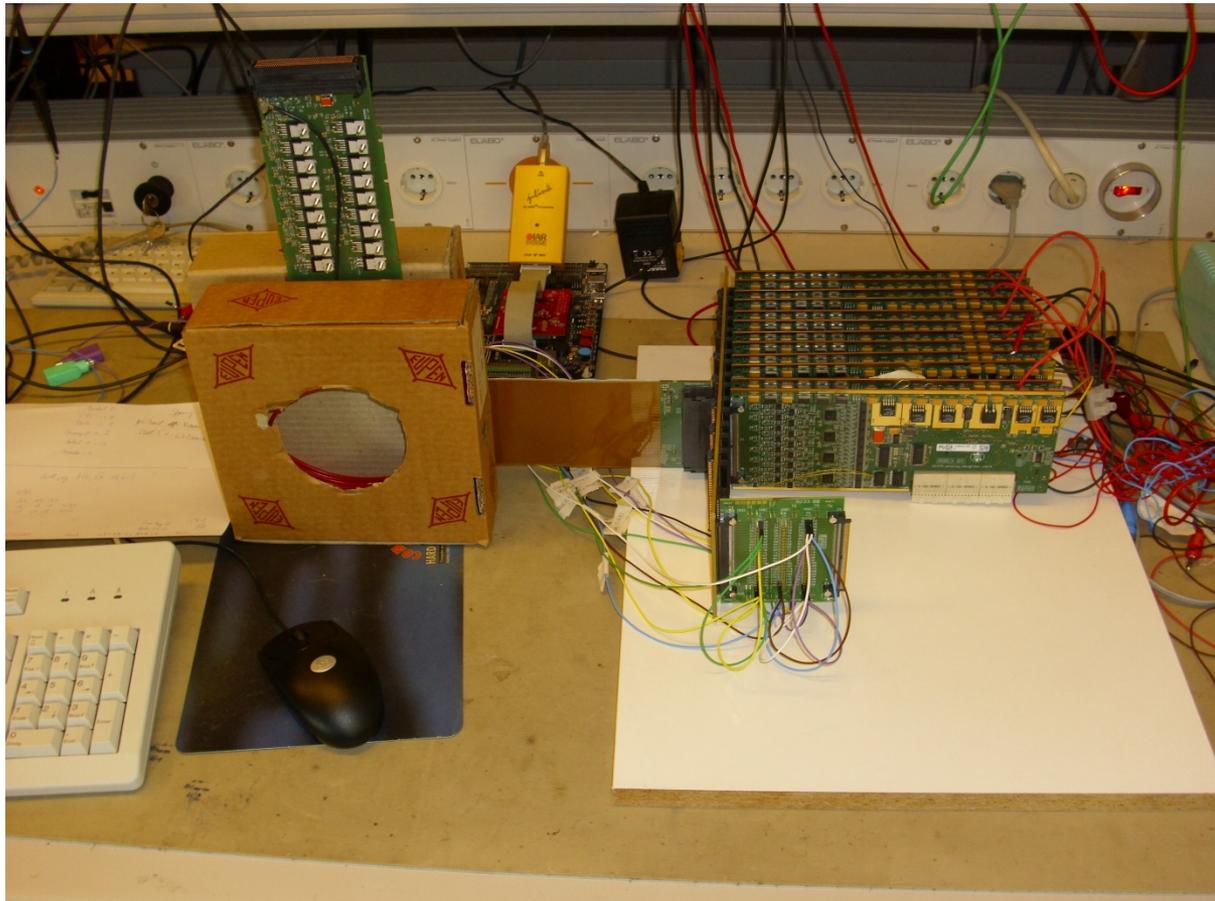


- Missing I2C power pull-down
Just now adapter PCB in hand.
- Soldered to be ON w/o I2C

Questions to needs not answered!

Analogue mother in production
for 2. and 3. 1mega-pixel
with modified layout

... but typical intermittent usage



... but damages

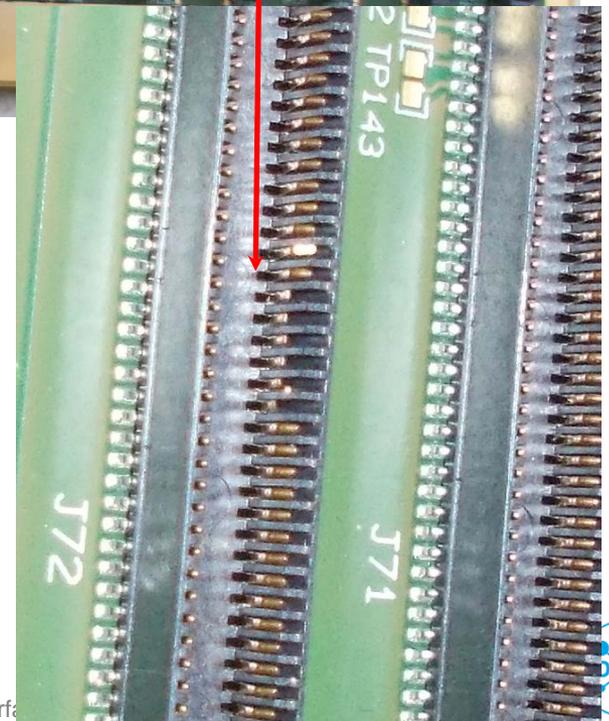


2 of 7 backplanes are damaged

- Repairable
- But how does it happen?
- Both damages are a group of pins

**Worry: If that happens in system,
it will be major work!**

- Is it just because of no rails?
- Was there something in between?



Heavy force to solder pads.

Should not go to usage
with hard access

How many looks like that?



Useful for test stands, firmware development

Be more careful, watch and tell how things happen,
return damaged boards

➔ I will look into getting things repaired

All field busses are operational
Branch structure for I2C can be handled

Structured sensor tables are prepared
analogue board/vacuum boards, digital not yet
→ Need command installation to transfer them to Ethernet

At the moment:

- Everything soldered, that the modules get to default state
- Communication to central FPGA not via SPI,
but direct Ethernet.
need of work at μ C and FPGA

Karabo: They want to reactivate discussions soon.
Since June they know, that LED's are switchable.

Command-counter:	32 bits	To follow losses and correlate answers x00000000 after long break as reset of command register ? x00000001 – x7FFFFFFF by KARABO, kept within answer x80000001 – xFFFFFFF by μ C self generated
Command-ID	32 bits	Telling what to do 3 bit command level - Level 1: generic field-bus of μ C - Level 2: generic field-bus of sensor/actor in branch-structure - Level 3: addressing by sensor/actor - Level 4: Full procedure
Address of fieldbus	32 bit	different levels
Address of sensor-location	64 bit	different bits representing the module topology
Number of data words	32 bit	
Data words	$n \times 32$ bit	Full data stream to field-bus
Consistency check	32 bit	

Draft

→ Minor re-discussions while μ C-programming, up to now kept.

5 boards in hand, some bug fixes modified,

2 needed for 1 Mega-Pixel

12 SOM's in hand

- Some hardware bugs found, fixed by wiring
- Fan control and monitor not yet tested. Which fans?

Mechanic Integration: Many discussion over last months

- Mechanical integration
- EMI : Is all metal (mechanics) following, even informed?
- Fans, cooling
- Connectors

→ I expect, that is will take time also in the future

→ Seems a lot of open work

I am not sure, whether all information are exchanged
Need to changes to interface?

Integration **to Karabo:** Much own μ C work
also preparation on KARABO-side
before first μ C connection.

Power

Replication... News to grounding in hutches



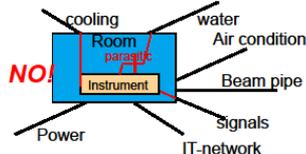
Making the construction independent of currents in the GND system EMI-zoning Main conceptual system issue!!!!

Goal: minimize the coupling between different areas, functions

- Minimize Z_K
- Maximize Z_E

Minimize Z_K (room planning)

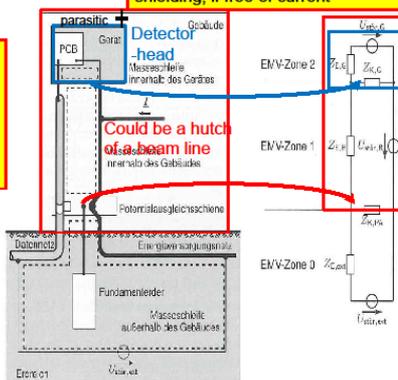
- All conductive connections at ONE point to instrument, to room, to building
- Afterwards/before distances to limit crosstalk
- Hard to get, than apply filters



Why not?

- Isolations for cooling, water, air, IT
- Short distance power, signals at ENTRANCE, not full length

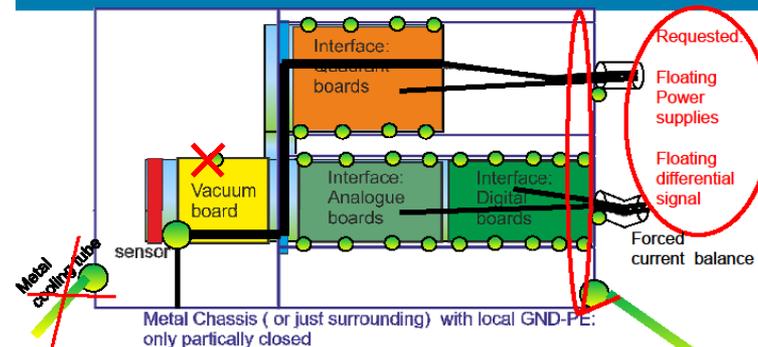
Multiple zoning: "parasitic coupling"
The hutch can already be a good shielding, if free of current



J. Franz, EMV, ISBN 978-3-8348-0893-6
Bild 7.32: Masseschleifen in einer Anlage nach ESB

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Keeping GND free of currents: AGIPD-plans



Using floating power supplies forces the currents to go to the power supply
Without using the general metal structures on PE.

Voltage drops on the metal of the detector are generated only by the fraction of none controlled currents. They will be there!

⇒ They don't generate currents within the external metal PE system, if only a small area provides the metal contacts to the outer world.

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Options from our electronics

- Guided return currents with limited flow in PE-system
- Local current returns of parasitic currents to PE with option to open.
- Differential signaling
- But everything is limited and not perfect
=> Doing now a mechanical/electrical concept to have low impact from and to others is realistic, later changes even for studies are major efforts.

The concept for industrial side planning is unlikely to be used for the XFEL-hutch planning:
"It is task of experiment to get itself independent"

