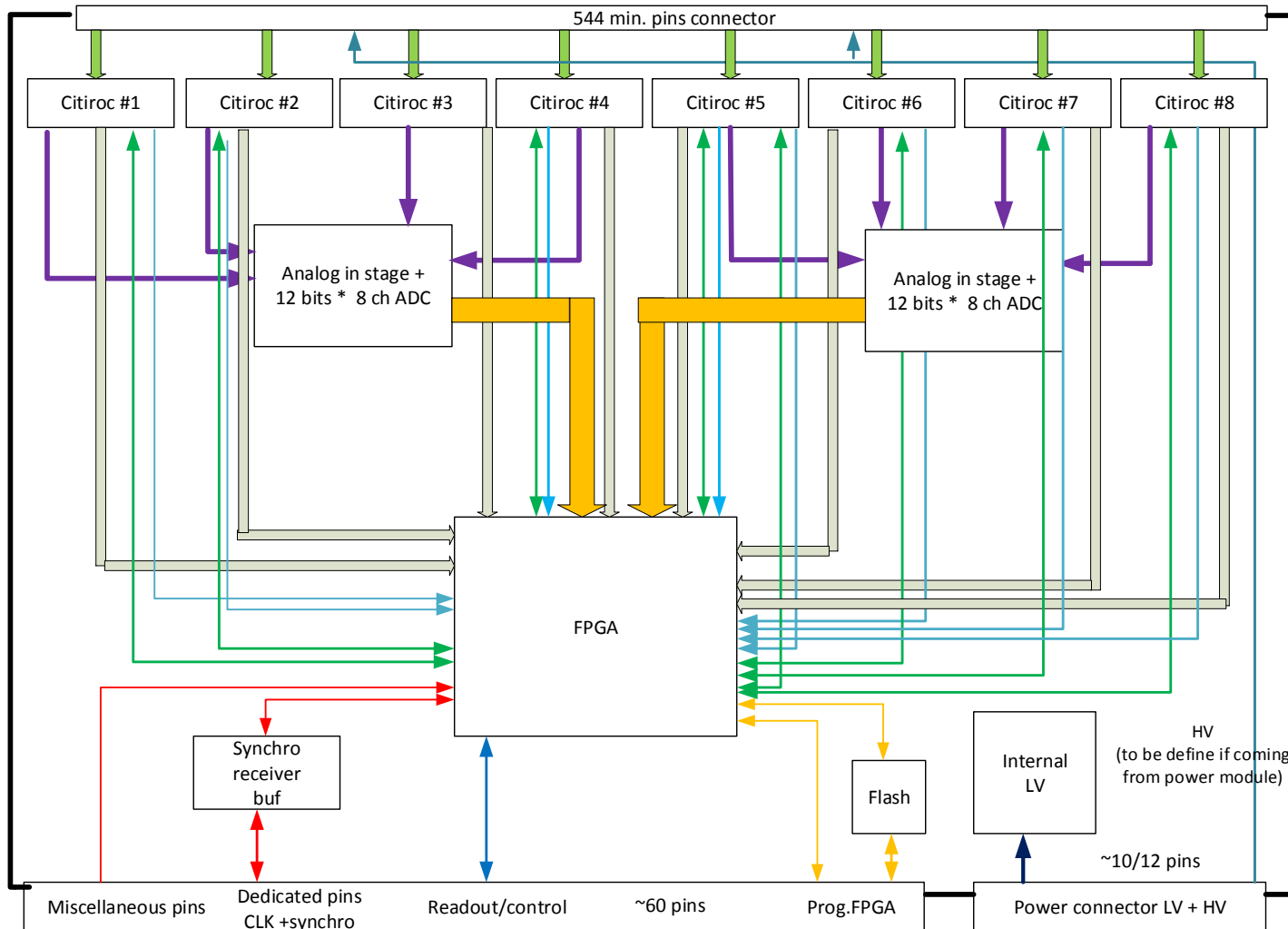


news sFGD board readout
LLR/UniGe group

Preliminary overview of FEB architecture



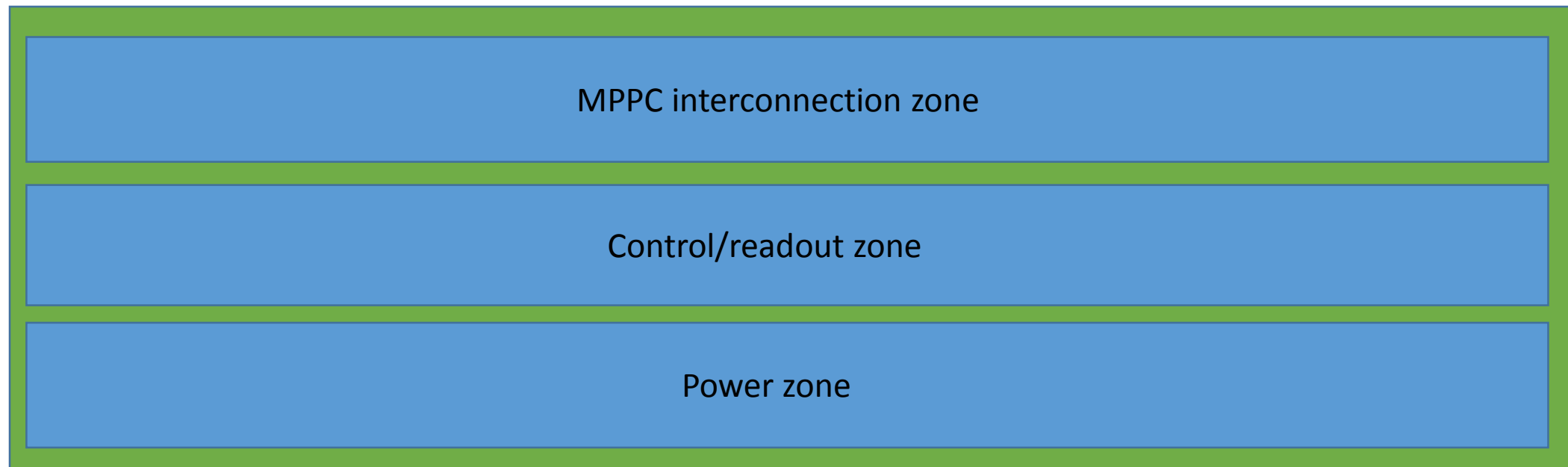
Remark : the 3 connection zone will be implemented on the same side on the FEB. (Connection to the BKP)

Backplane slots

Based on 6U crate/format :

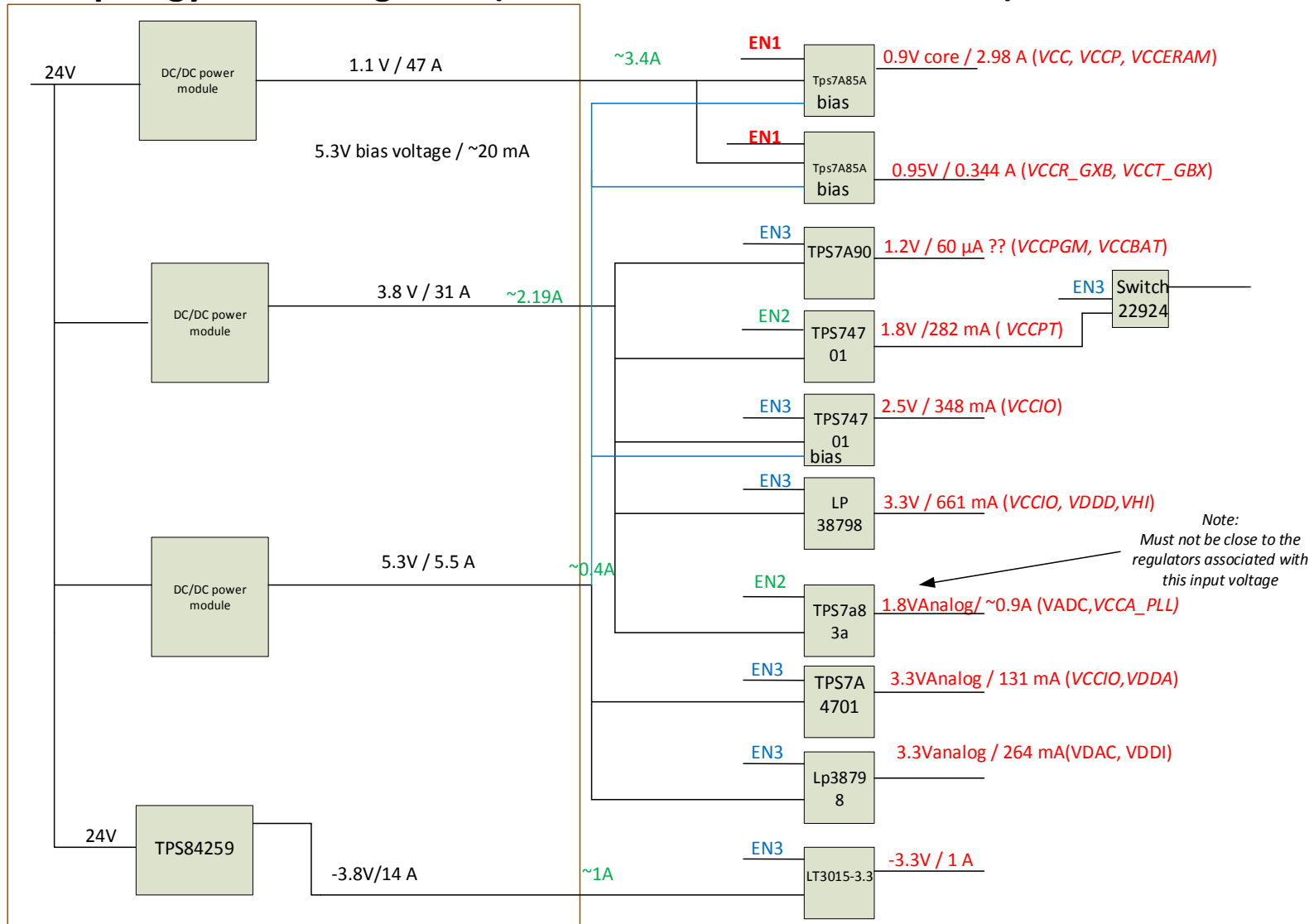
- 1 slot/crate for optical module
- 1 slot/crate for power module
- 14 slots/crate for FEBs

On BKP each part (zone) will be separated with the others
Each slot will have a hardcoded value (14 slots : 4 bits) and added 3 or 4 bits with jumper or other to coded the bkp number.



Update of FEB low power architecture

Topology Low voltage FEV (ARRIA 10 / carte 6 U / 8 citiroc)



- Compare to the previous meeting:
- One LDO has been modified (1.8VA: mistake on estimation consumption).
 - New LDO is connected to the 3.8V to avoid to avoid an increase of power dissipation.
 - That involve :
 - 3.8V/18A becomes 3.8V/31A
 - 5.3V/14A becomes 5.3V/5.5A

For the power sequencing 2 solutions are in study.

Simple : on/off voltage sequencer with an enable command coming from the optical board

Complex: Using a supervisor chip (I²C compatible) to sequence voltages and monitors voltage/current

Low power module

For the power module, a study must be done on DC / DC converters.

For example. Texas Instrument offers a stackable DC/DC converters.

This solution could be considered :

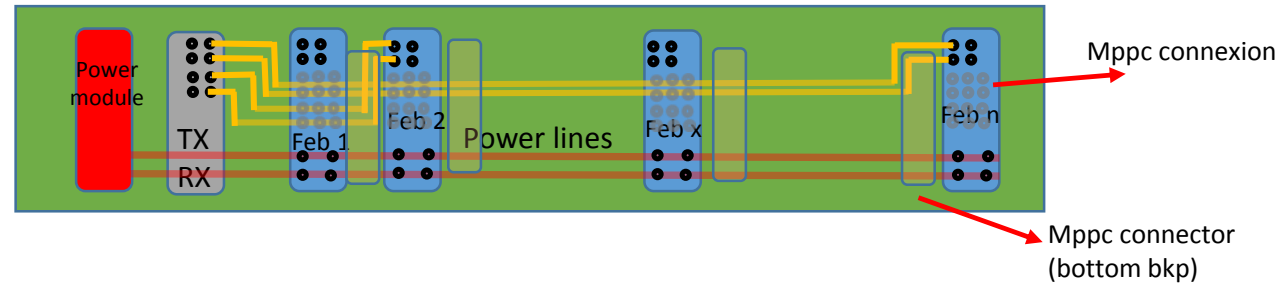
TPS546C20A : out : 0.35V to 5.5V 35A 2x stackable (70A)

Several solutions are possible but must be evaluated.

Maybe a commercial modul could be a solution : in this case, which price, which size and the connexion for our specific backplane.

Backplane proposition

This drawing is a idea or proposition for the FEB connexion to the backplane



Estimate of the number of pins on the FEB connector.

First approach

Readout: 2 pairs TX/RX

Slow control : 2 pairs TX/RX



Point to point connection : avoid to loose a lot of channel compare to daisy chain

MPPC connexion

6U board : 544 pins min per FEB (MPPC signal + GND+ HV+Temperature)

Constraints : Layout for the Backplane,

Connector for the power module/board: pins current rating

We found many connectors dedicated for backplane but all can't be used due to volume

Connectors comparison

Connectors	TE Z-PACK UHD	SAMTEC ExaMAX	ERNI DIN 225028	TE Z-PACK HM	MOLEX GbX I-Trac	SAMTEC HDTF
Number of pins	96	140	200	200	140	64
Width (mm)	17.3	20.9	50	50	28.6	14.4
Depth (mm)	24.5	28.4	23.3	23.2	37	29.4
Thickness (mm)	12.5	22.5	19.8	17.4	15.9	16.4
Number of needed connectors	6	4	3	3	4	9
Analogue occupancy (%)	45	36	64	64	49	56
Crate occupancy (%) + 5mm/board insertion	57	90	81	73	68	70
Price connector on FEB	19.65\$	20.22€	?	14.93\$	17.45€	7.97€

MOLEX GbX I-Trac is the best choice, cause of pin density, number of connector needed (for placement and insertion) and price.

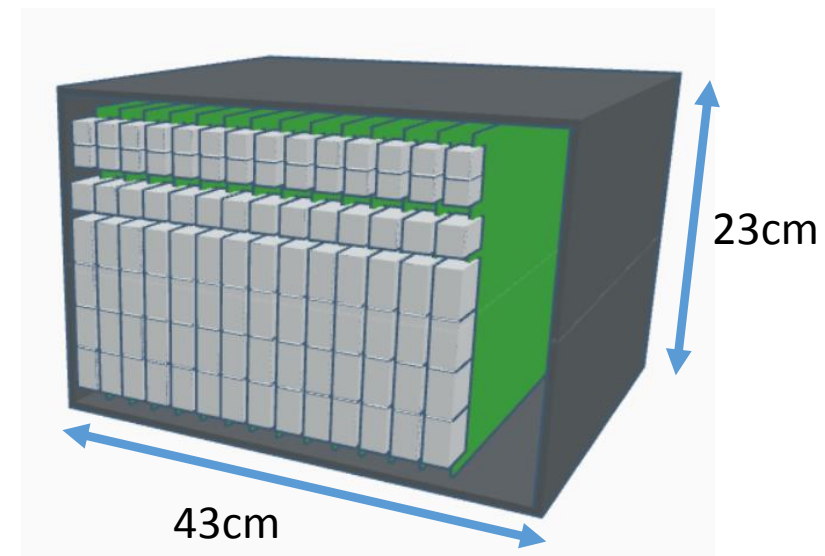
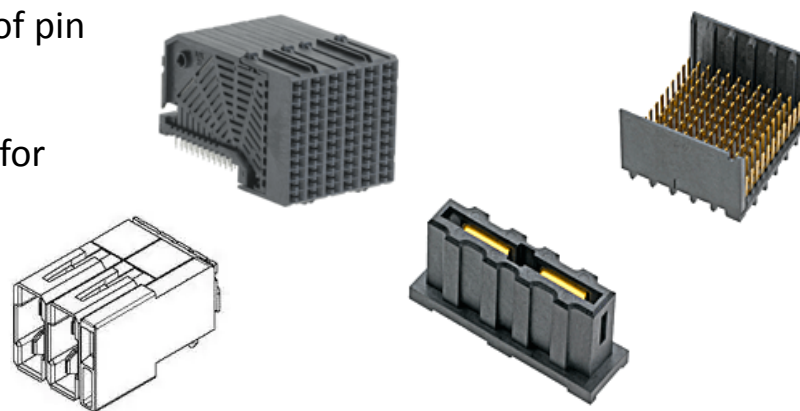
In the same family we have good candidate for power.

Connectors references (www.molex.com):

Analog: [760201010](#) / [760151102](#)

Digital: [760201004](#) / [760151424](#)

Power: [782291033](#) / [782271001](#)



Constraints:

- 14 FEB + 2 boards in 43cm
- (512 inputs signal + HV+ T°) + digital + power in 23cm

