Local protection Redundant Power supply (DQLPUR) - Review

- DQLPUR (new 6 voltages DC power supply)
  - MPE/EP power requests
  - Design (theory)
  - Design (schematics)
  - Design (implementation)
  - Today's situation
  - What's Next ?

Local protection Redundant Power supply (DQLPUR)
MPE/EP power requests

MPE/EP section asked for:

- Six DC voltages (& the following currents)

Equipment	+5.6 V isolated	+15 V isolated	-15 V isolated	+5.6 V common	+15 V common	-15 V common
DQQDL_A	100	50	50	0	0	0
DQQDL_B	100	50	50	0	0	0
DQAMC	0	0	0	250	100	100
DQHSU	0	0	0	250	40	20
DQCSU	0	0	0	250	20	10
SPARE_1	0	0	0	250	50	50
Total	200	100	100	1000	210	180
Requested Current	500 mA	250 mA	250 mA	2000 mA	500 mA	500 mA
Power	2.8 W	3.75W	3.75W	11.2W	7.5W	7.5W

Total power requested = 36.5 W

- Voltage decay: All the 6 voltages should remain at least for 100ms after a power cut.
- The insulation between the 3 isolated Voltages and the earth should be > 1.9 kV.
- Full Redundancy on all these voltages (in total they need 12 DC Voltages)

Local protection Redundant Power supply (DQLPUR)
Design (theory)

- For these linear power supplies, we are using the LT 1084 regulator (same as the one use in the nQPS powerpacks)
- Rated output current of 5[A]
- It as a Short circuit protection (by limiting the output current to a maximum)

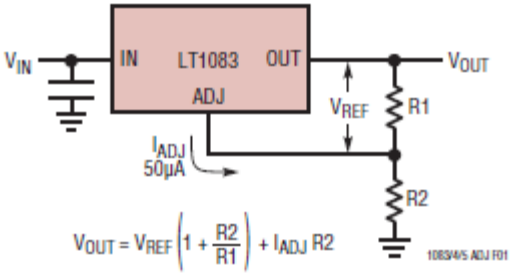


Figure 1. Basic Adjustable Regulator

Left board schematic

Local protection Redundant Power supply (DQLPUR) Design (schematics)

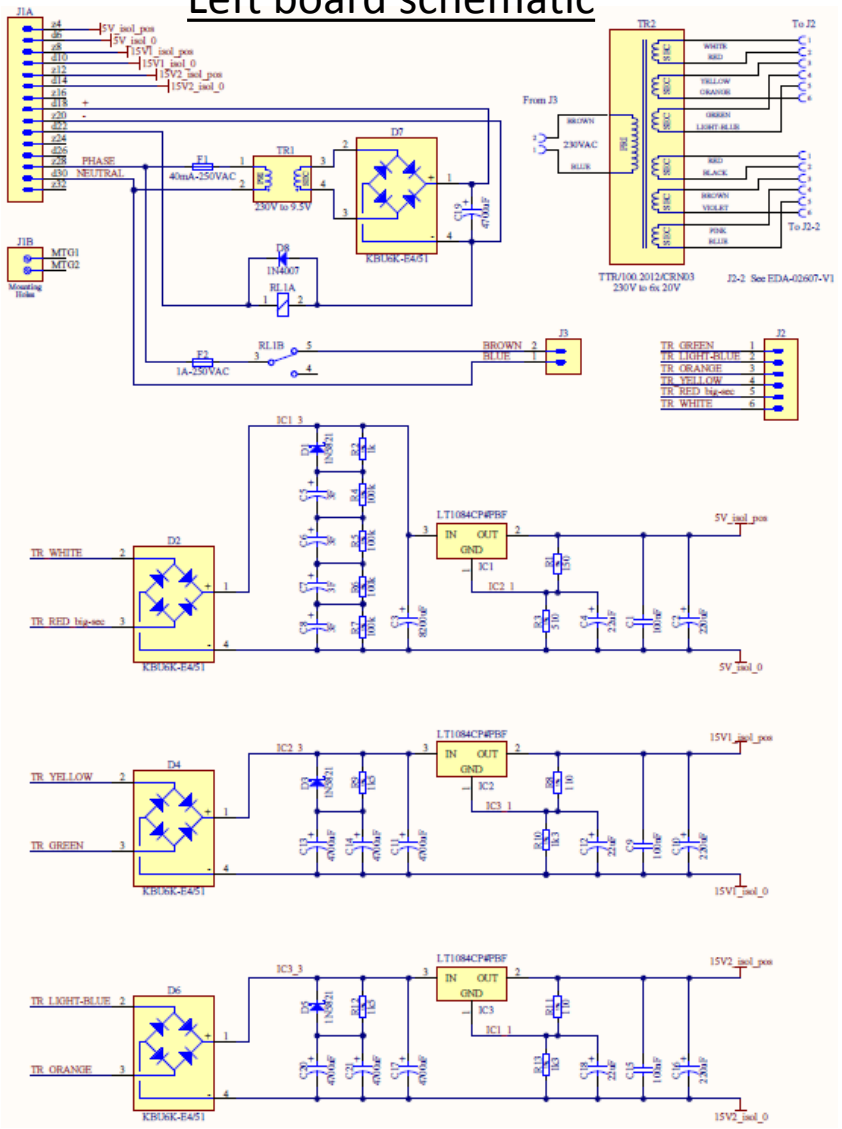
Left PCB (common/earth potential, EDMS: EDA-02607) :

- 3 voltages (+5,+15,-15 VDC)
- 1 power-cycle circuit (P.S. + Relay)

Right PCB(isolate/ magnet potential, EDMS: EDA-02607) :

- 3 isolated DC (+5,+15,-15 VDC)

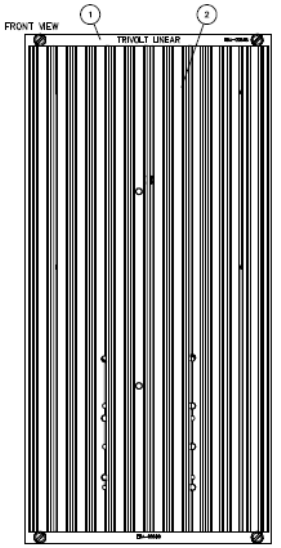
Left board schematic

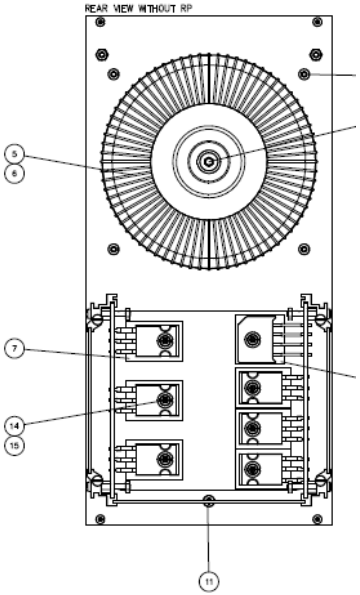


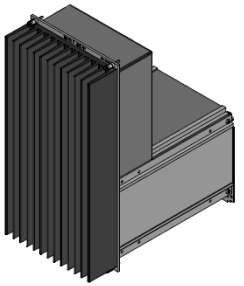
Local protection Redundant Power supply (DQLPUR)
Design (implementation)

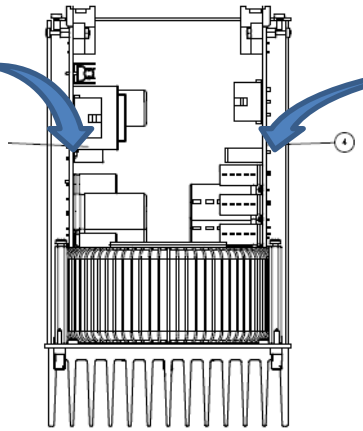
Items fixed on the Heat sink :

- 6 regulators
- 100VA transformer
- 1 rectifier Bridge









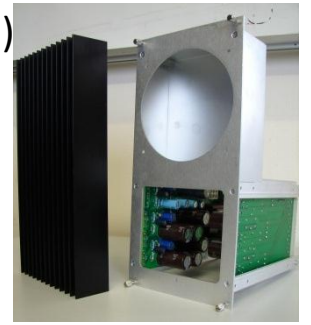
Common (earth potential)

Isolated (magnet potential)

Local protection Redundant Power supply (DQLPUR)
Today's situation

- A First DQLPUR prototype (without the remote power cycle function) was built and tested (see Steve presentation).

- The second DQLPUR prototype was assembled by Mathieu
  These unit is under test (Heat run, power cycle function, ripple meas.)



Local protection Redundant Power supply (DQLPUR)
What's Next ?

- Complete de test of the second prototype
- We already found an insulation problem on these second prototype -> new PCBs iteration needed

- Mathieu is preparing a second "version 2 prototype" -> to be supplied next week to EPC for testing.

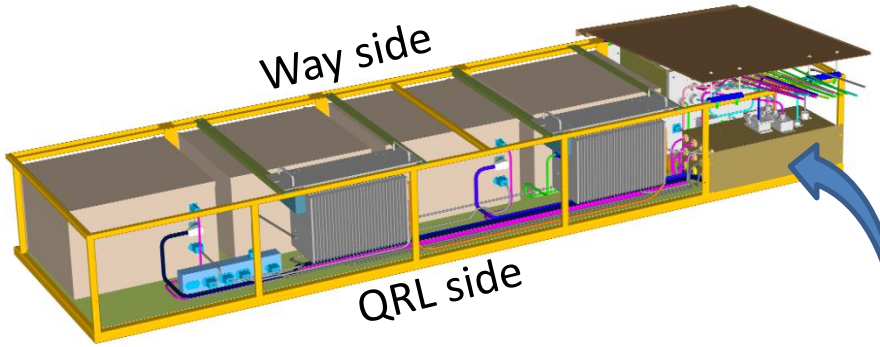
- The final documentation should be ready in January 2013 for the production of 2'700 DQLPUR in the Industry.

- We are know contacting manufacturers to get prices offers (&delivery times) for the "most expensive" items in the DQLPUR (mechanical box, Heat sink, main transformer)

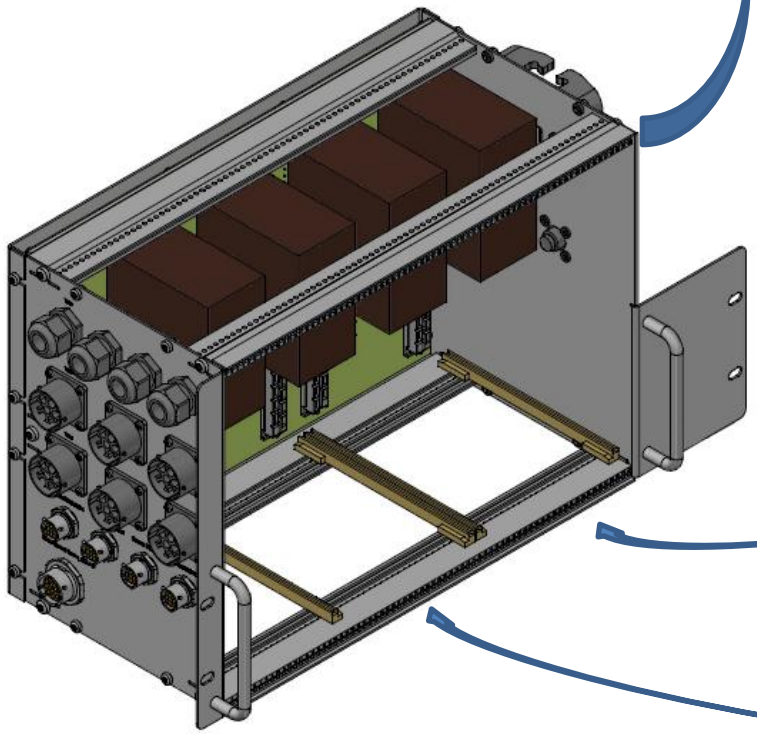
- The market Survey process is in progress (see Knud presentation)

Questions ?

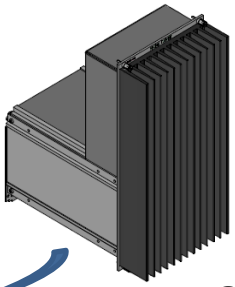
Interface Module (DQLIM) progress status
Annex 1: DQLPUR insertion in the DQLIM



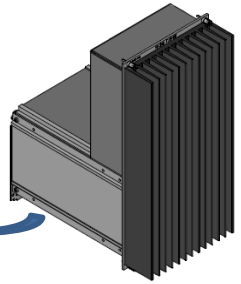
DQLIM



DQLPUR (UPS1)

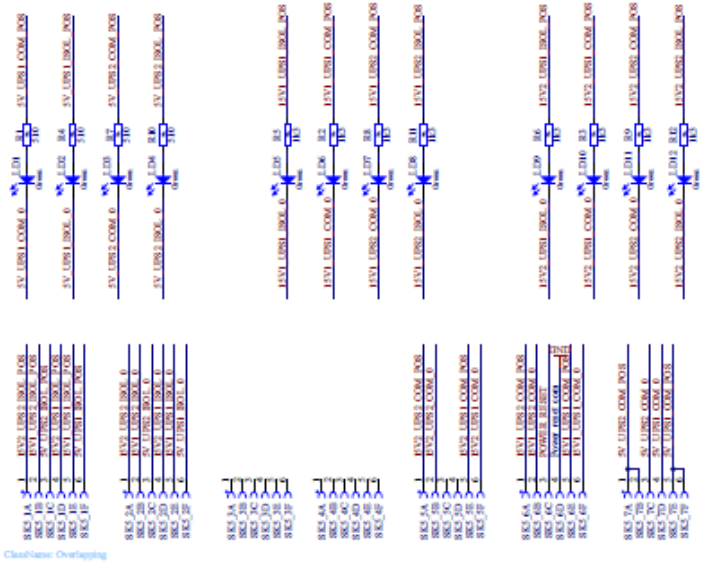


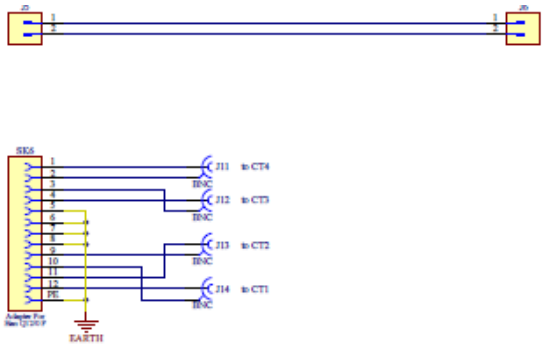
DQLPUR (UPS2)

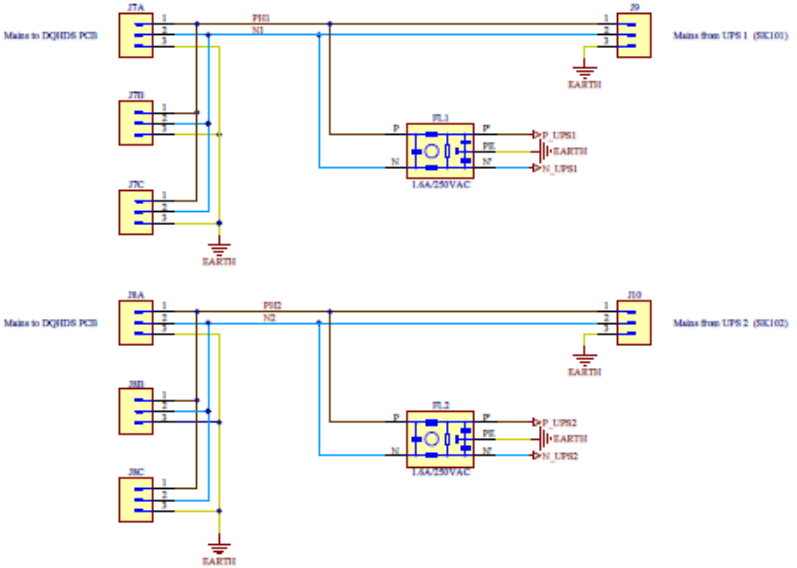


Interface Module (DQLIM) progress status

Annex 2: DQLIM motherboard schematic







Courtesy of J.M Wickham