

Power supply Testbeam experience

Florian Lütticke, Felix Müller, Botho Paschen

MPP,
University of Bonn



Power Supply Testbeam Experience

- LMU PS Mechanics:
 - Final housing → sturdy and nice for transport
 - Rack missing for easy and stable setup, especially with the required fan
- Operation:
 - Full EPICS integration with clean CS-studio interface
 - Easy switching from lab setup (one PS) to two PS plus config database (except for slight problems with ConfigDB)

3LED CONNECTED OVP THERMAL UPS RUNNING														
TABLE DISABLE														
	min.	Set Current	max.	min.	Set Voltage	max.	Reg.	Voltage at Regulator	Voltage at Load	Current				
ab	0 mA	0 mA	0 mA	0 mV	0 mV	0 mV		-19 mV	-6 mV	0 mA	sw-sub			
sd	0 mA	30 mA	30 mA	0 mV	1800 mV	2000 mV		2560 mV	1794 mV	8 mA	sw-dvdd			
in	0 mA	0 mA	0 mA	0 mV	0 mV	0 mV		-21 mV	-7 mV	0 mA	sw-refin			
w	0 mA	1300 mA	1300 mA	0 mV	400 mV	500 mV		597 mV	398 mV	-1190 mA	dcd-amplo			
sd	0 mA	3000 mA	3000 mA	0 mV	1900 mV	2000 mV		4346 mV	1900 mV	2749 mA	dcd-avdd			
sd	0 mA	940 mA	1000 mA	0 mV	1900 mV	2000 mV		3071 mV	1899 mV	685 mA	dcd-dvdd			
in	0 mA	1000 mA	1000 mA	0 mV	900 mV	1300 mV		2677 mV	898 mV	362 mA	dcd-refin			
re	0 mA	730 mA	800 mA	0 mV	1200 mV	1640 mV		2383 mV	1206 mV	440 mA	dhp-core			
lo	0 mA	550 mA	550 mA	0 mV	1800 mV	2000 mV		2889 mV	1805 mV	197 mA	dhp-lo			
lk	0 mA	10 mA	10 mA	0 mV	10000 mV	10000 mV		9998 mV	9999 mV	0 mA	bulk			
jn	0 mA	30 mA	30 mA	0 mV	20000 mV	22000 mV		19997 mV	20008 mV	22 mA	clear-on			
ff	0 mA	30 mA	30 mA	0 mV	3000 mV	20000 mV		2932 mV	3001 mV	-18 mA	clear-off			
i1	0 mA	30 mA	30 mA	-4000 mV	-1500 mV	3000 mV		-1537 mV	-1507 mV	-4 mA	gate-on1			
i2	0 mA	30 mA	30 mA	-4000 mV	-1500 mV	3000 mV		-1537 mV	-1495 mV	-4 mA	gate-on2			
i3	0 mA	30 mA	30 mA	-4000 mV	-1500 mV	3000 mV		-1534 mV	-1498 mV	-4 mA	gate-on3			
ff	0 mA	30 mA	30 mA	0 mV	3000 mV	6000 mV		3062 mV	2993 mV	20 mA	gate-off			
se	0 mA	100 mA	150 mA	0 mV	6000 mV	7000 mV		7042 mV	6003 mV	49 mA	source			
j1	0 mA	10 mA	10 mA	-5000 mV	-500 mV	0 mV		-503 mV	-500 mV	1 mA	cog1			
j2	0 mA	10 mA	10 mA	-5000 mV	-500 mV	0 mV		-506 mV	-500 mV	1 mA	cog2			
j3	0 mA	10 mA	10 mA	-5000 mV	-500 mV	0 mV		-504 mV	-505 mV	1 mA	cog3			
lv	0 mA	10 mA	10 mA	-80000 mV	-70000 mV	0 mV		-70015 mV	-70037 mV	0 mA	lv			
ift	0 mA	10 mA	10 mA	-6000 mV	-5000 mV	0 mV		-5005 mV	-5005 mV	0 mA	drift			
er	0 mA	0 mA	10 mA	0 mV	0 mV	0 mV		-12 mV	-9 mV	0 mA	polycover			
rd	0 mA	10 mA	30 mA	-6000 mV	-5000 mV	0 mV		-5007 mV	-5000 mV	0 mA	guard			

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TABLE DISABLE														
	min.	Set Current	max.	min.	Set Voltage	max.	Reg.	Voltage at Regulator	Voltage at Load	Current				
ab	0 mA	0 mA	0 mA	0 mV	0 mV	0 mV		-45 mV	-29 mV	0 mA	sw-sub			
sd	0 mA	30 mA	30 mA	0 mV	1800 mV	2000 mV		2582 mV	1803 mV	10 mA	sw-dvdd			
in	0 mA	0 mA	0 mA	0 mV	0 mV	0 mV		-41 mV	-27 mV	0 mA	sw-refin			
w	0 mA	1300 mA	1300 mA	0 mV	400 mV	500 mV		582 mV	405 mV	-1158 mA	dcd-amplo			
sd	0 mA	3000 mA	3000 mA	0 mV	1900 mV	2000 mV		4259 mV	1900 mV	2636 mA	dcd-avdd			
sd	0 mA	940 mA	1000 mA	0 mV	1900 mV	2000 mV		3096 mV	1904 mV	689 mA	dcd-dvdd			
in	0 mA	1000 mA	1000 mA	0 mV	900 mV	1300 mV		2666 mV	901 mV	361 mA	dcd-refin			
re	0 mA	730 mA	800 mA	0 mV	1200 mV	1640 mV		2382 mV	1197 mV	443 mA	dhp-core			
lo	0 mA	550 mA	550 mA	0 mV	1800 mV	2000 mV		2911 mV	1800 mV	209 mA	dhp-lo			
lk	0 mA	10 mA	10 mA	0 mV	10000 mV	10000 mV		10005 mV	9995 mV	0 mA	bulk			
jn	0 mA	30 mA	30 mA	0 mV	20000 mV	22000 mV		20078 mV	20005 mV	21 mA	clear-on			
ff	0 mA	30 mA	30 mA	0 mV	3000 mV	20000 mV		2934 mV	3001 mV	-17 mA	clear-off			
i1	0 mA	30 mA	30 mA	-4000 mV	-1270 mV	3000 mV		-1309 mV	-1277 mV	-4 mA	gate-on1			
i2	0 mA	30 mA	30 mA	-4000 mV	-1270 mV	3000 mV		-1328 mV	-1274 mV	-8 mA	gate-on2			
i3	0 mA	30 mA	30 mA	-4000 mV	-1330 mV	3000 mV		-1367 mV	-1337 mV	-4 mA	gate-on3			
ff	0 mA	30 mA	30 mA	0 mV	3000 mV	6000 mV		3071 mV	2996 mV	23 mA	gate-off			
se	0 mA	100 mA	150 mA	0 mV	6000 mV	7000 mV		7015 mV	6003 mV	50 mA	source			
j1	0 mA	10 mA	10 mA	-5000 mV	-500 mV	0 mV		-503 mV	-503 mV	0 mA	cog1			
j2	0 mA	10 mA	10 mA	-5000 mV	-500 mV	0 mV		-503 mV	-507 mV	1 mA	cog2			
j3	0 mA	10 mA	10 mA	-5000 mV	-500 mV	0 mV		-501 mV	-505 mV	1 mA	cog3			
lv	0 mA	10 mA	10 mA	-80000 mV	-70000 mV	0 mV		-70090 mV	-70031 mV	-2 mA	lv			
ift	0 mA	10 mA	10 mA	-6000 mV	-5000 mV	0 mV		-5001 mV	-5002 mV	0 mA	drift			
er	0 mA	0 mA	10 mA	0 mV	0 mV	0 mV		-27 mV	-19 mV	0 mA	polycover			
rd	0 mA	10 mA	30 mA	-6000 mV	-5000 mV	0 mV		-5010 mV	-5002 mV	0 mA	guard			

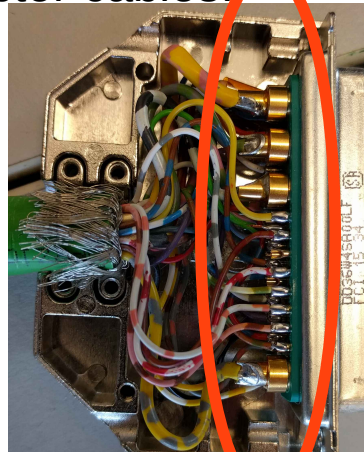
Problems at DESY:

- PS units non-functional:
 - Several units malfunctioned
 - not sufficiently tested before beam campaign (or damaged in transport)
 - Voltage drop bug
 - power supplies were not sufficiently prepared with necessary upgrade before going to DESY, all units had/have to go back to LMU for repair
- PS cables non-functional:
 - New long cables unusable because of shorts
 - New cables unusable with Hybrid 5 system
 - reason still a mystery!
 - Only some of the old cables worked
 - insufficient testing before beam campaign
- PS software bugs:
 - Communication of PS and EPICS not completely stable depending on startup order
 - Crosstalk at startup between PS in network caused sudden shutdown
 - dangerous! Easily prevented during operation, needs to be fixed

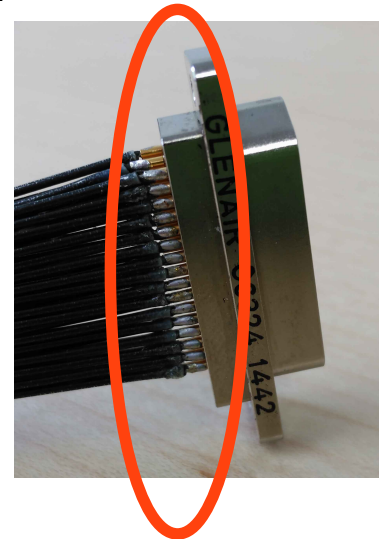
Problems and Testing:

- Cables:
 - Production and quality control

D sub connector cables:



Glenair cables:



- Testing at lab (or DESY) extremely difficult and time consuming
 - need for dedicated testing cards
 - best case: hardware module simulator
 - minimally: adapter card connecting sense and force wires for measurement

Thank you

