LMU LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN

LMU München - Excellence Cluster Universe

PS & Services

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DEPFET Collaboration Meeting
Seeon
10.05.15-13.05.15

Overview

- Operation experience of Preproduction PS
- Main production

Services

- Status of Kapton development
- Patch Panels for L2bwd
- Status of Cables

Operation of Preproduction PS

- 4 PS setups installed at our collaboration institutes, 2 additional ones are currently in installation

- MPI testing effort heavily relies on the PS's

→ So far no major flaws discovered

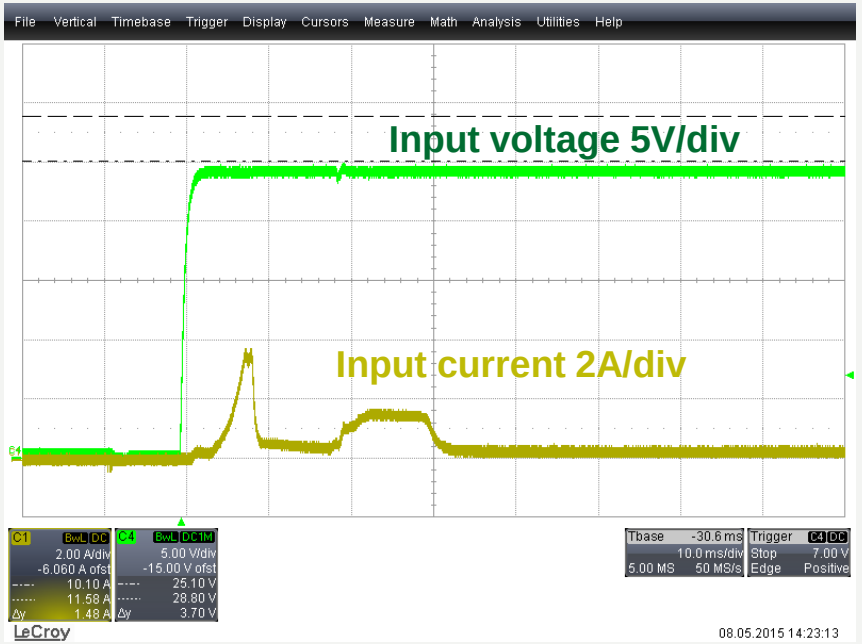
Lessons learned:

- Sanity check before installation in setup – possible damage due to transport, voltage levels
- Periodically use the auto calibration of the SMU when hunting for mVs while calibration
- Two units suffered under a fault of the hot-swap controller – series pass element / internal charge pump damaged
- Using some Units with certain primary PS's startup is not stable
  → Investigating alternative approach for inrush current limiting. Test circuit will be available after this meeting

Inrush current

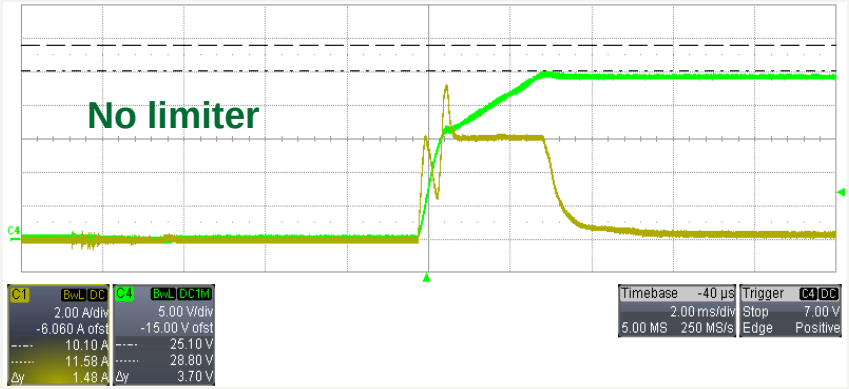
- While startup of primary power decoupling capacitors must be charged, some transient current to start DC/DC converters of the monitoring system and the MCU

→ Current peaks can drive PS's into current limit
→ DC/DC converter are a constant power load
i.e. have negative input resistance



Inrush current

- Without limiter current is only limited by PS - PS is in current limit while startup
- Limiter prevents that primary PS goes into current limit



Main Production – overview

Goal: production of 68 PS units for both KEK PF and PXD

- Procurement of individual components under way – connectors, IC's
  - $/€ rate has noticeable impact on our budget

- Fairly large batch with more than 1600 channels in 408 regulator cards

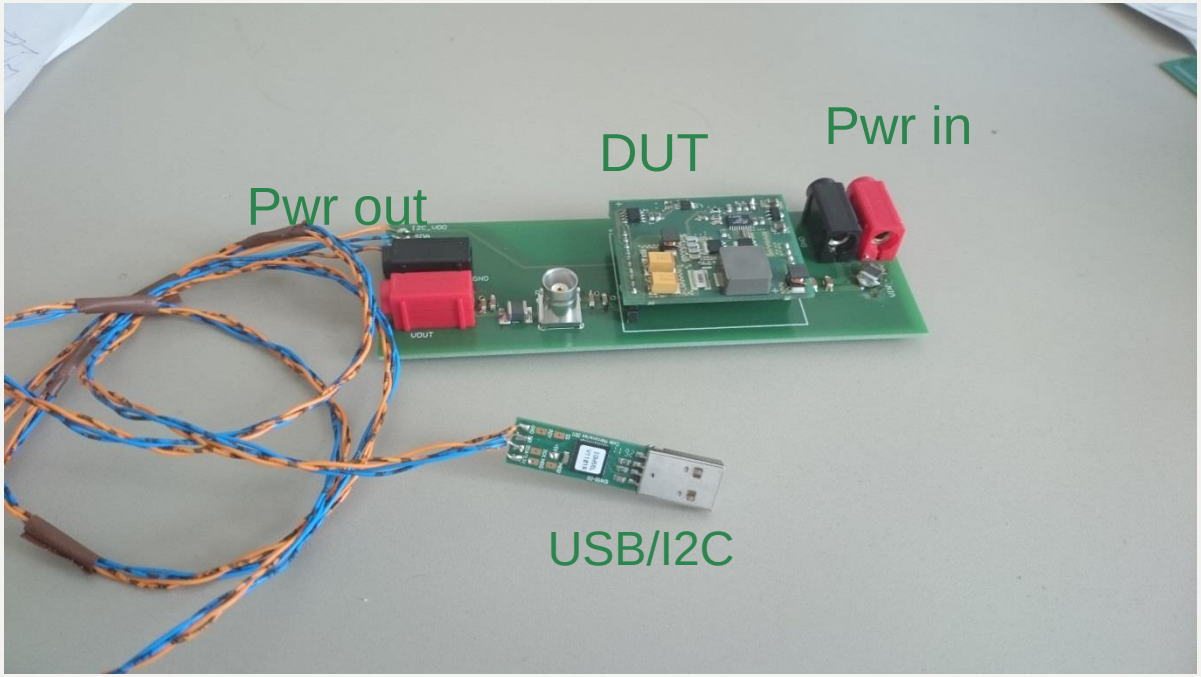
→ Systematic QA of individual components necessary

- Individual components are difficult to access in the box

→ Test setups needed providing an environment similar to the final one in the PS unit

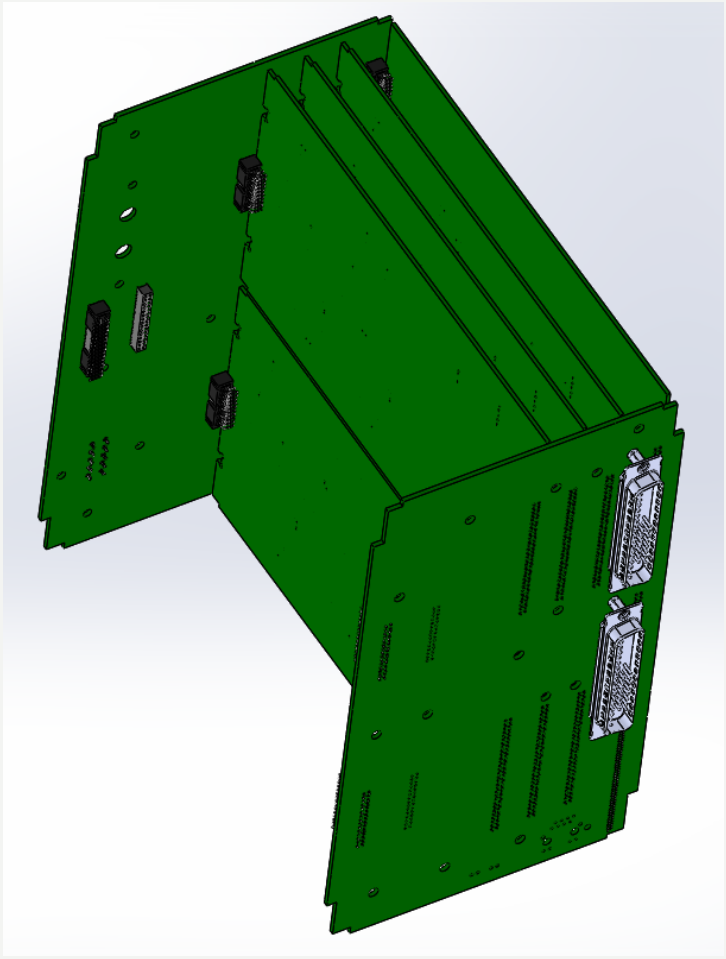
Main Production – Stepdown converter

- Full batch in production – 140 pieces
- Expected delivery mid May
- Test board for QA available



Main production

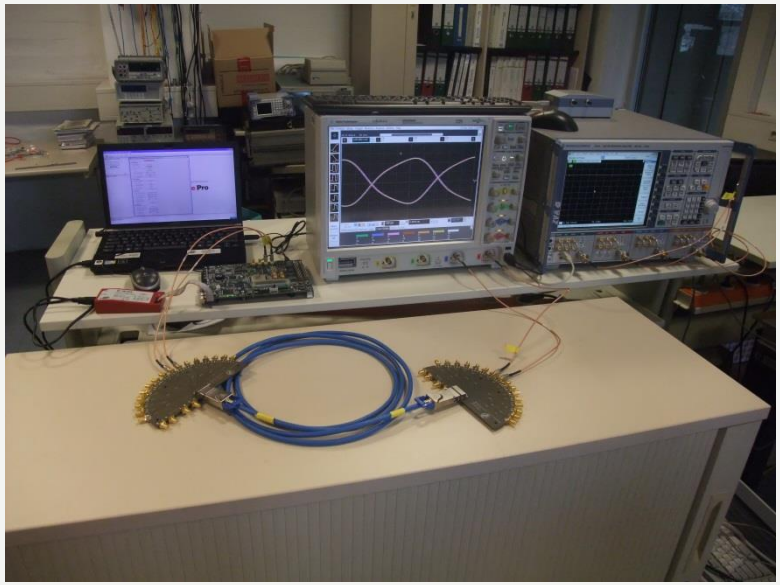
- Production of the Front- and Backboards in preparation
- Currently some bug fixes under way
- Ordering expected in May



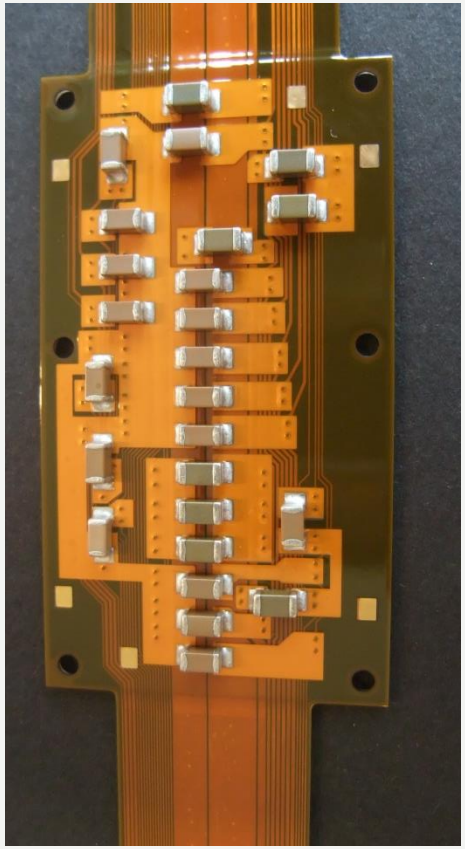
Services

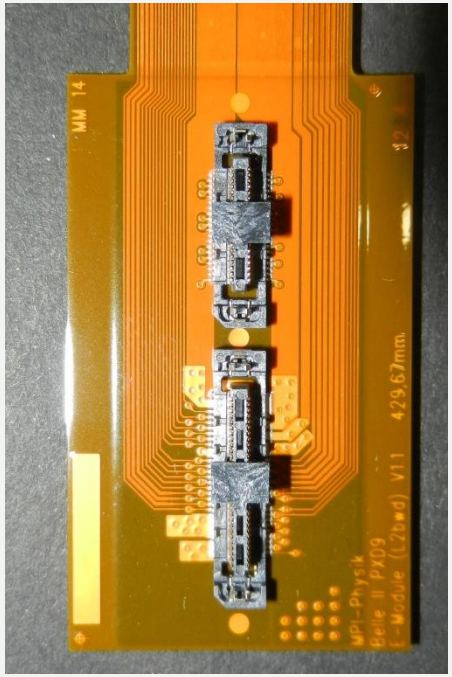
Kapton

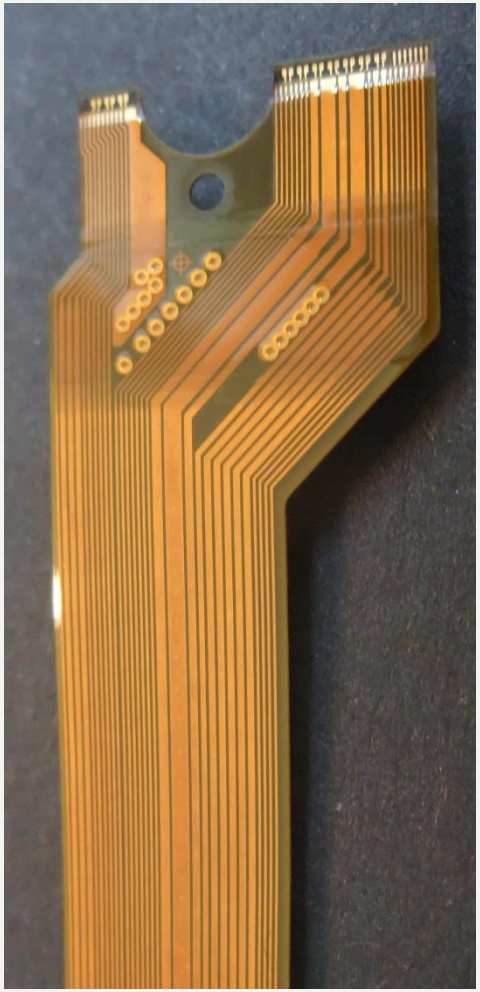
- L2Bwd design has been finished in February, production of remaining Kaptons is ongoing
- 5 L2Bwd Kapton are delivered including passives
  - Capacitors of high reliability / automotive grade
  - Preparation of test measurements is ongoing at MPI and Bonn
- Design of the remaining ones is ongoing
- Waiting for input from pilot run for the procurement of the production Kaptons



Kapton

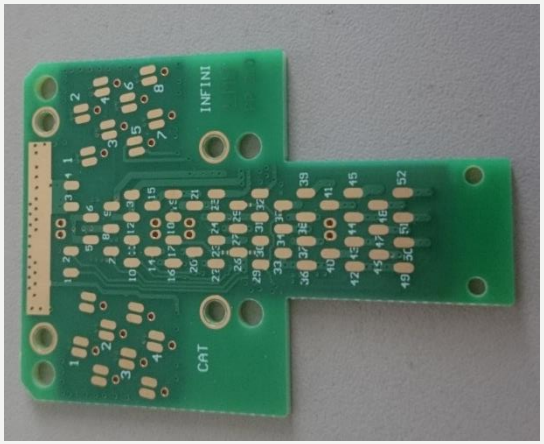


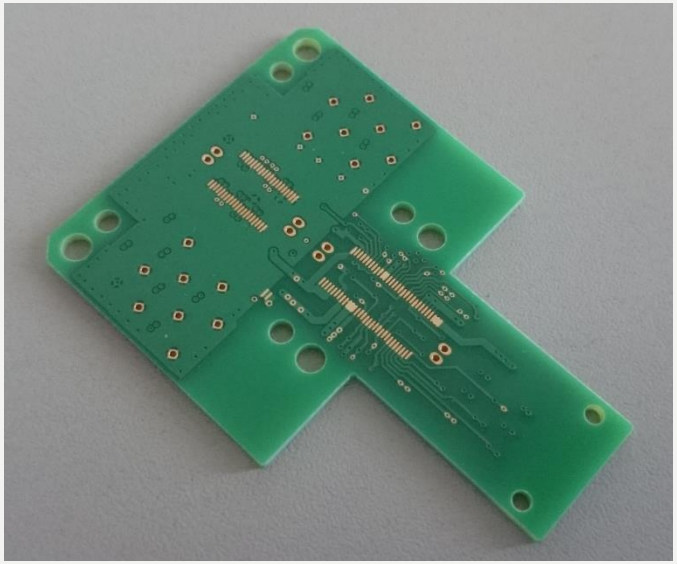




Patch Pannel

- To ease the Kapton design we have an individual PP for each Kapton
- The L2bwd PP has been designed and produced
- Latest interface using ethernet and infiniband cable
- Currently one fully equipped PP is prepared in the MPP electronics workshop and will be available for the pilot run

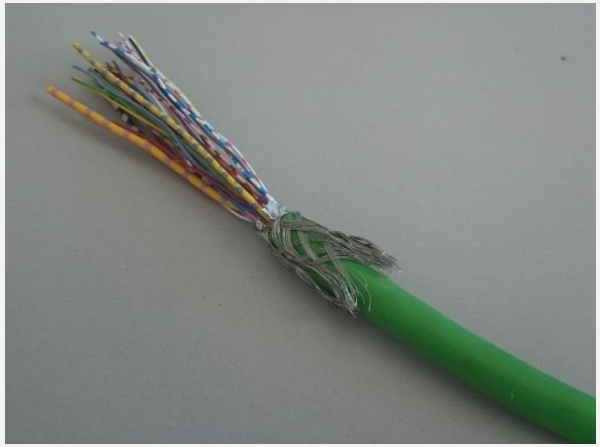




Status of Cables

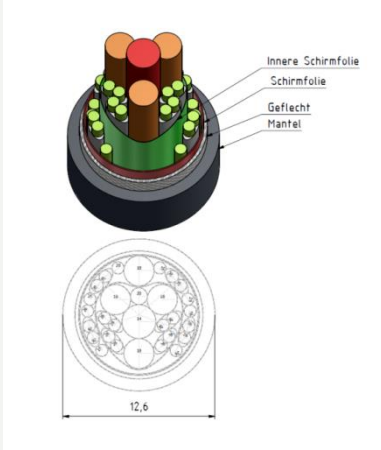
Power cable:

- Design is in place
- Prototype is heavily used in the test setups using the LMU-PS
- Investigation within the grounding project done
  → Results in Fernandos talk
- Mechanical integration is looking promising
- Procurement after Pilotrun?



Data cables:

- Cables for baseline solution selected according to our requirements
- Decision of final layout is still open
  - Input from irradiation campaign, testing of data transmission in lab and pilot run necessary

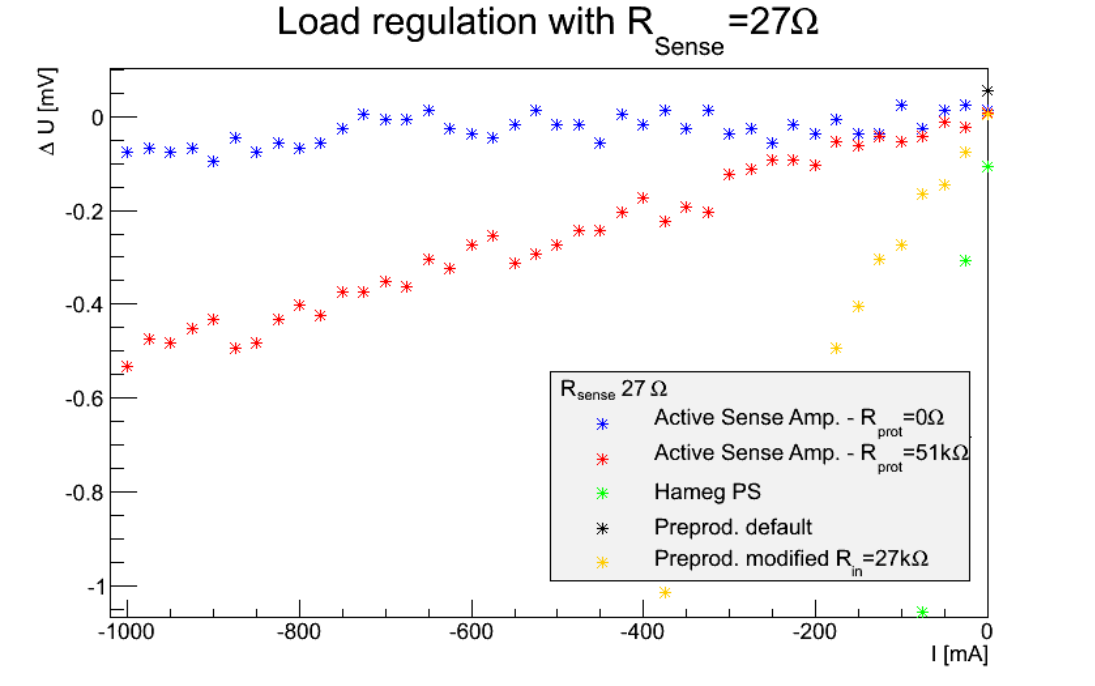


Summary

- LMU PS's becoming an essential component of the testing effort
- Main production taking momentum – several designs are in or close to mass production
- In parallel test setups for QA are prepared
- L2bwd Kapton prototypes are available for the pilot run
- Adapterboard, PP for Pilotrun testing available

Backup

Load regulation



- Preproduction in modified configuration significantly improves output DC impedance to 2.5mW significantly better than commercial unit
- Baseline for main production: Active sense amplifier with 51k protection resistor