LMU LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN

LMU München - Excellence Cluster Universe

PS, Services, Grounding

Stefan Rummel
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Overview

- PS – Production, OVP, Firmware
- Grounding
- Dockboxes – Production, Testing
- Second set cables

PS – Production

- Commissioning of units completed
  - 50 units dedicated for PXD
  - OVP build in, not enabled

- Software to test OVP is has been finished in 12/17
  - Each OVP condition is tested, shutdown levels are determined

  → First systematic tests revealed issue with one important channel

- Condition: for Vref-Vsub only single limit applied

  → Rework towards window: -0.4V<(Vref-Vsub)<2.2V ongoing

- First 10 units have been adapted
  - Rate of rework ~10/WD

→ 10 units can be shipped to DESY within January

PS – Firmware

- Observation: Parallel operation of 4 units showed issue while simultaneous power up

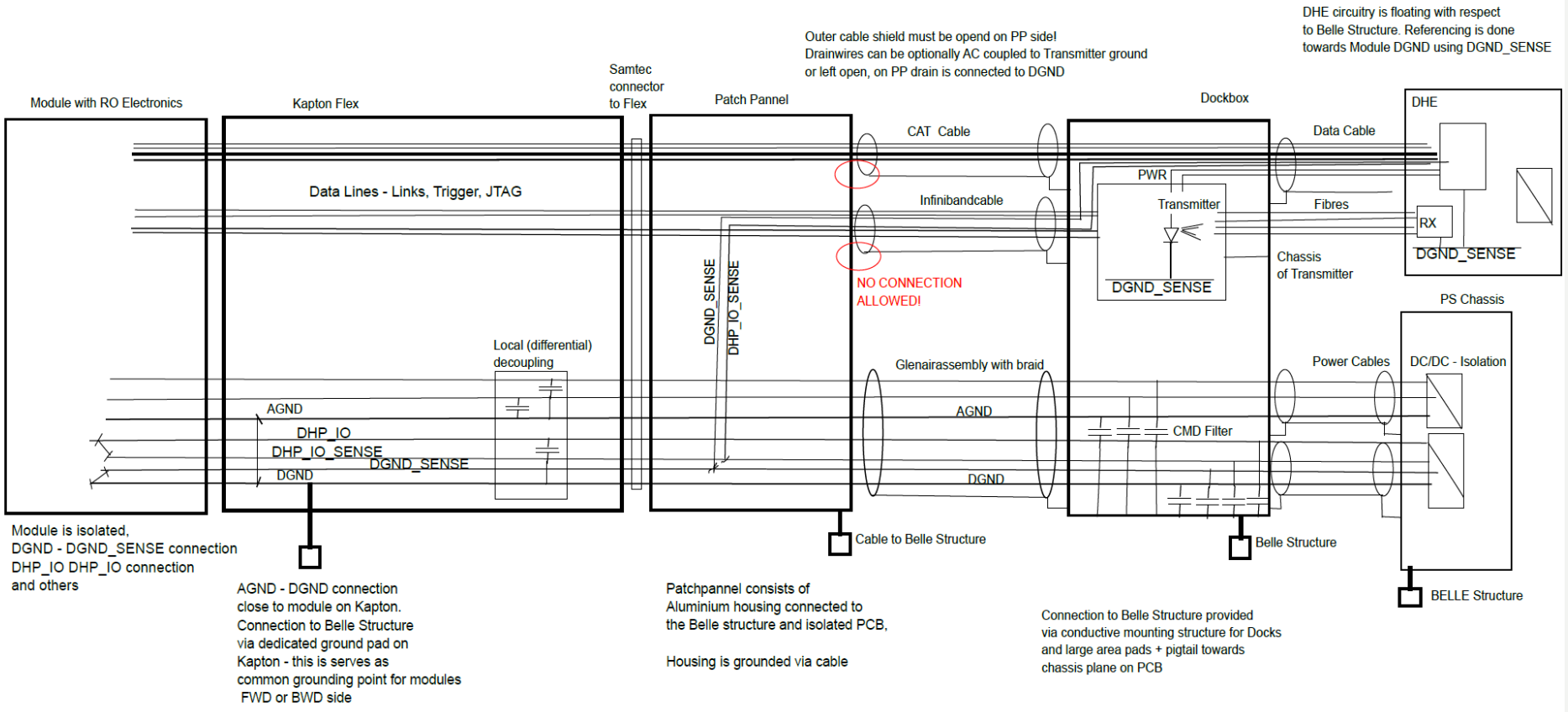
- Investigations showed that commands are distributed to all nodes instead of a point to point connection
  - Probably a horrible way to implement our specification to have broadcast commands to all units available…

- Commands transmission is organized by XME middleware
  - Black box for most developers

Possible options:
(1) Restart firmware project with TUM/Fortiss. However most people worked on the project have left (project running 2011 to early 2013)
(2) Remove XME from firmware

→ Michael will report on option 2

Grounding – Baseline



- Based on the recommendations from ITA/Fernando
- Details like referencing the transmitter / DHI not covered

Grounding

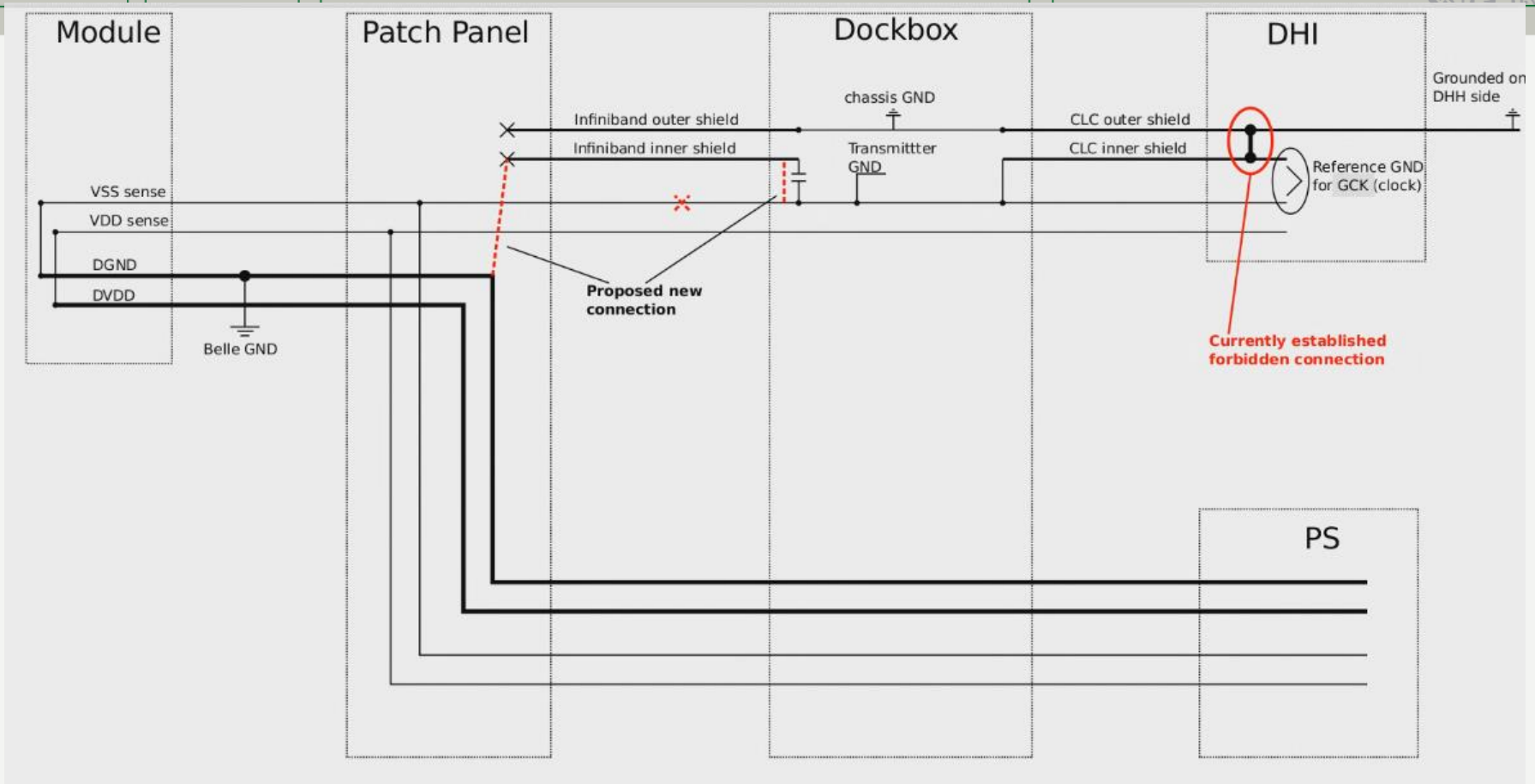
- ITA / Fernando worked out grounding scheme

→ Baseline for PXD

Phase 2 commission revealed a set of issues in the grounding scheme:

- Transmitter housing internally connected to gnd
  - Dockbox connected transmitter housing to chassis gnd
  - → Short of chassis gnd to transmittter gnd
  - → Fixed using tape, pads towards screws opened
- Accidental connection of inner shield of Infiniband cable and PP housing
  - → Should be fixed by detailed production documentation by ACK
- Intentional connection on DHI between inner shield of CLC and chassis gnd
  - → Loss of ground sense wire(!) as ground sense is used as transmitter ground
- Link stability was only achieved by shorting transmitter ground to chassis
  - → Sense wire has high resistance
- DCD_MON cable pair carries DGND_SENSE, too
  - → Need to be adapted while PP production

Grounding – next steps



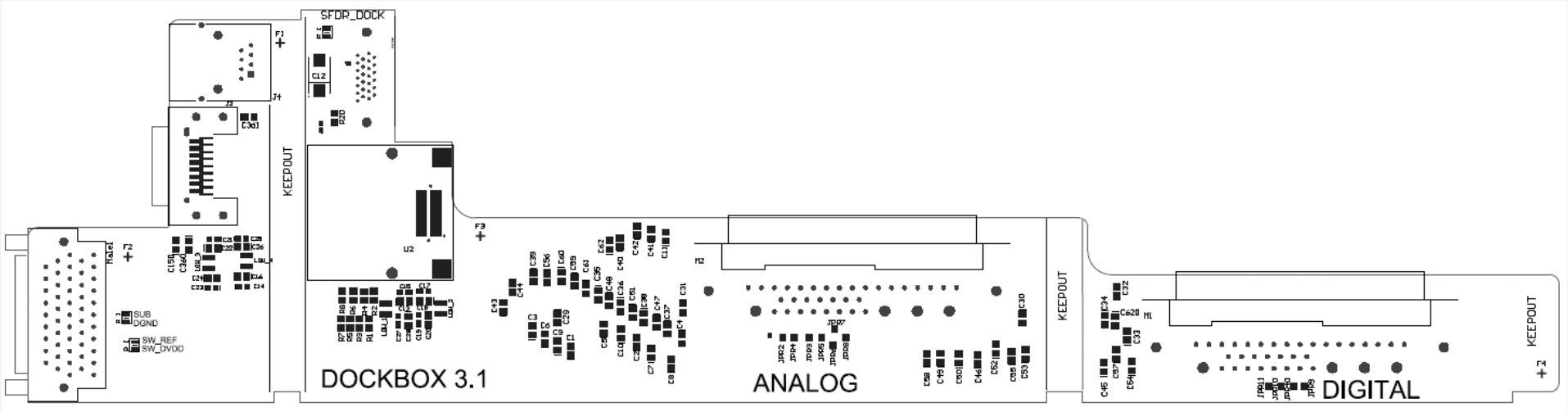
- Use Inf.B. cable drain wires /inner shield to define potential of transmitter and DHI, remove connection between CLC shields on DHI

→ Restore DGND sensing

Dockbox

- Dockboxes:
  - First batch of 12 production boxes has been produced
  - EMS via MPI electronics workshop
  - Setting jumper, testing of power at LMU
  - Ongoing mounting and testing of transmitters at TUM
  - Flexibility to adapt grounding by exchanging R/C

→ Aiming for final batch once green light from collaboration



Dockbox
Changes 3.0 to 3.1

- Topoverlay (Names of components, strings for documentation) is switched on
- All capacitors are marked, the power connectors with names, similar to the PS - "analog" and "digital"
- Jumpers (where required) are named with the possibilities they offer (eg. sw_sub / sw_dvdd ....)
- SW_SUB jumper has been replaced with a net tie, therefore no manual soldering is required anymore
- Version of box now mentioned
- Connections to the mounting holes of the transmitter are disconnected from the chassis-ground as the transmitter housing is internally connected to TGND
- Pads of the transmitters have been changed from chassis-ground to TGND
- Passives around the keepout areas have been moved from the keepout

→ Jig for safe mounting developed by ACK

Services cables

- Camera link cables available at DESY
- Power cables available, one batch of 11 is still at LMU
- Fibers/transmitter available at LMU

Second Set:

- Application for funding has been granted in December
- Most pressing item the power cables have been ordered – lead time ~5 month
- Dockboxes dummies will be prepared by DESY
- Orders for Fibers, Connectors, Cameralink-cables will be ordered soon

Summary

- PS commissioning done, OVP testing ongoing
- 10 units for DESY within January
- Major improvement in firmware stability, scalability expected

- First set of cables available

- Procurement of the second set started in December

- Final batch of Dockboxes can be started after decision of collaboration

Backup

Patch panel

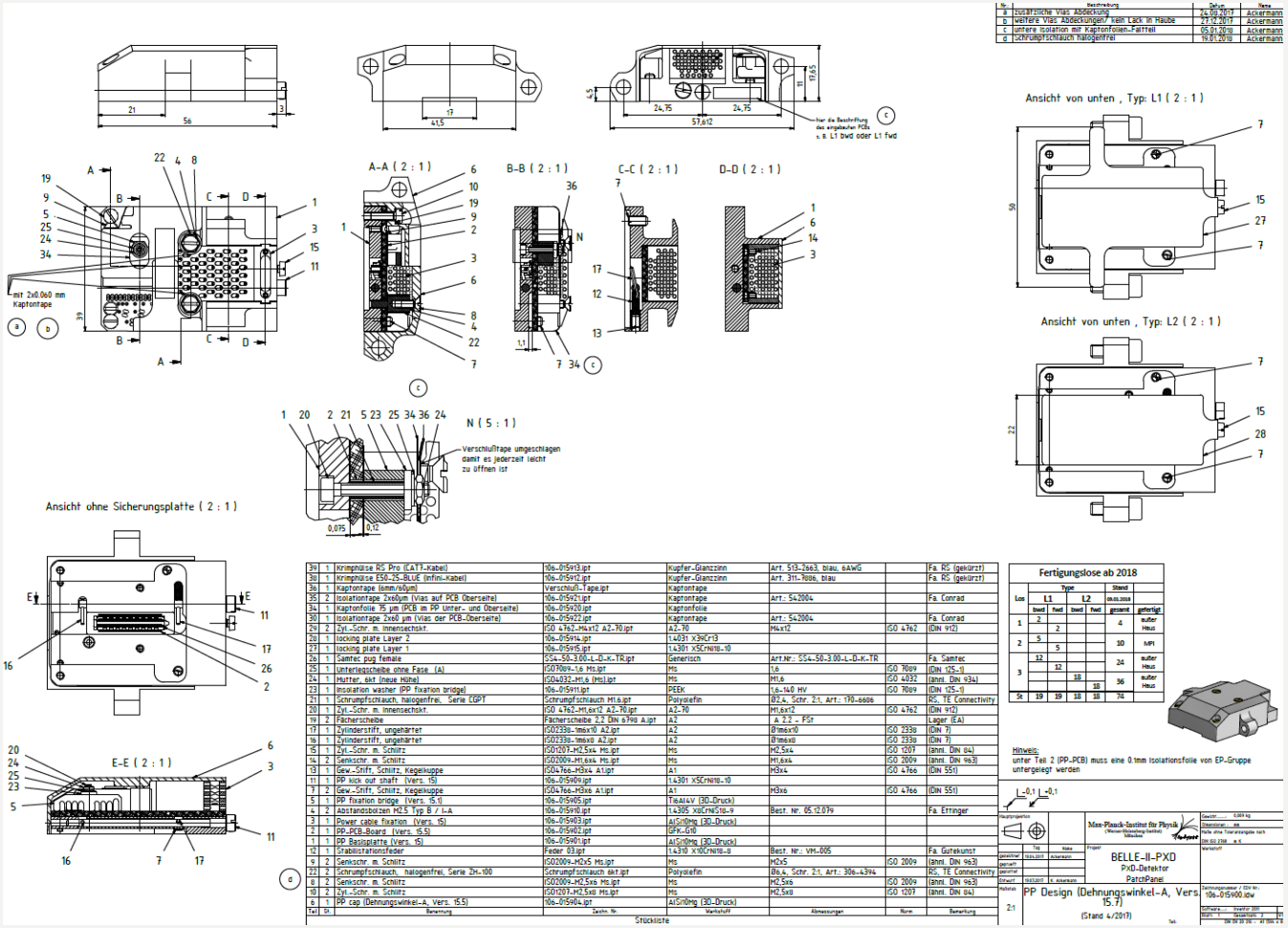
- Components for PP availiable
  - Infinibandcables
  - Glenair 165cm, 185cm and some 200cm
  - 30 housings for PP production availiable

- Issue: Final length of cables not decided

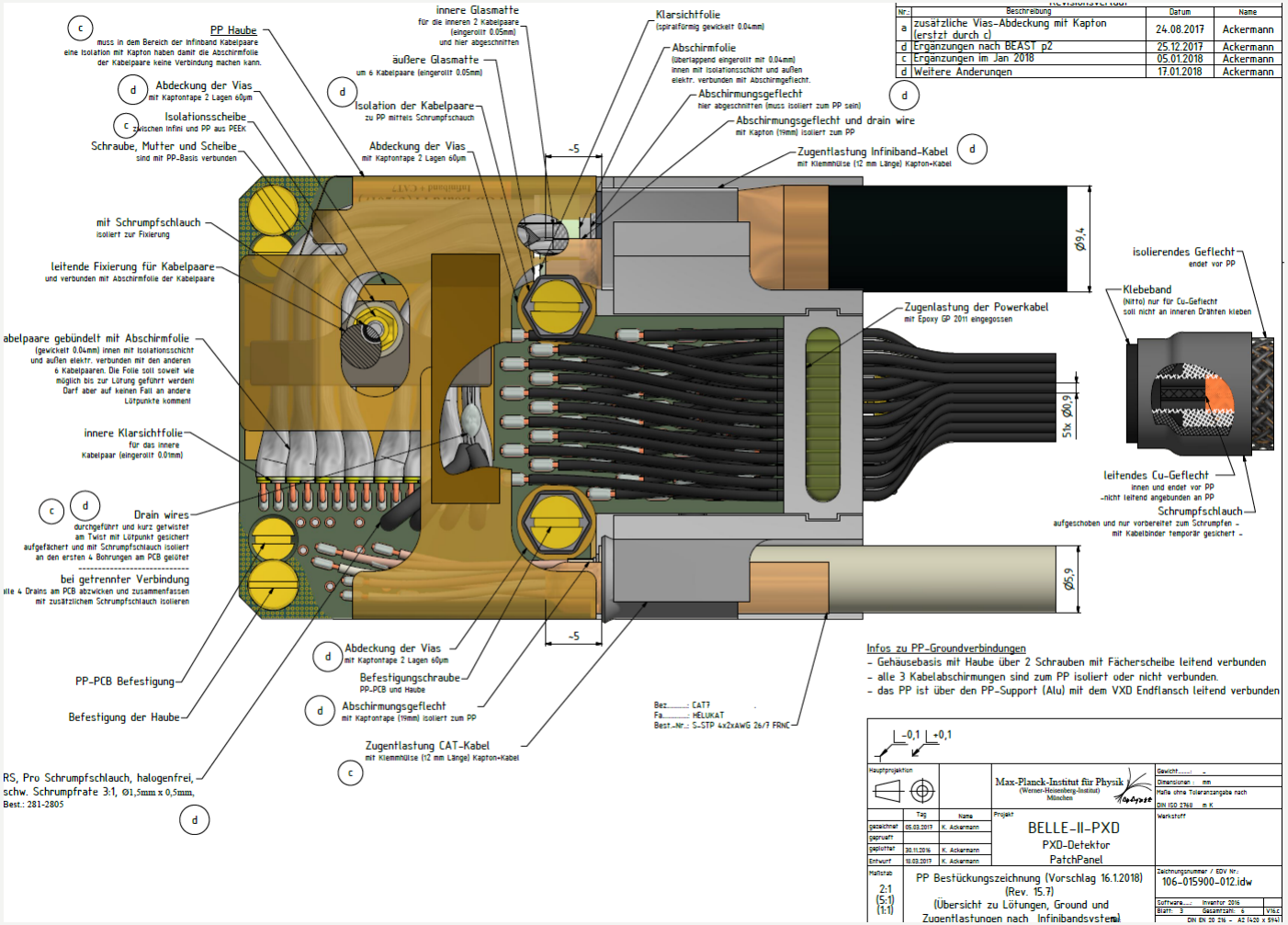
- Issue: Availability of slots for manufacturing at HighQ EMS
  - Glenair assembly by E-Workshop @ LMU
  - First PP assemblies (10) done by E-Workshop @ MPI

Services - PP

- PP production has been documented in detail by ACK, incorporating all our experience



Services - PP


PP Haube
Abdeckung der Vias
Isolationsscheibe
Schraube, Mutter und Scheibe
mit Schrumpfschlauch
leitende Fixierung für Kabelpaare
innere Klarsichtfolie
Drain wires
bei getrennter Verbindung
PP-PCB Befestigung
Befestigung der Haube
RS, Pro Schrumpfschlauch, halogenfrei, schw. Schrumpfrate 3:1, Ø1,5mm x 0,5mm, Best.: 281-2805
innere Glasmatte
äußere Glasmatte
Isolation der Kabelpaare
Abdeckung der Vias
Klarsichtfolie
Abschirmfolie
Abschirmungsgeflecht
Abschirmungsgeflecht und drain wire
Zugentlastung Infiniband-Kabel
Zugentlastung der Powerkabel
mit Epoxy GP 2011 eingegossen
isolierendes Geflecht
endet vor PP
Klebeband
(Nitto) nur für Cu-Geflecht
soll nicht an inneren Drähten kleben
leitendes Cu-Geflecht
innen und endet vor PP
-nicht leitend angebunden an PP
Schrumpfschlauch
aufgeschoben und nur vorbereitet zum Schrumpfen –
mit Kabelbinder temporär gesichert –
Befestigungsschraube
PP-PCB und Haube
Abschirmungsgeflecht
Zugentlastung CAT-Kabel
Ø9,4
5x Ø0,9
Ø5,9
-5
Infos zu PP-Groundverbindungen
- Gehäusebasis mit Haube über 2 Schrauben mit Fächerscheibe leitend verbunden
- alle 3 Kabelabschirmungen sind zum PP isoliert oder nicht verbunden.
- das PP ist über den PP-Support (Alu) mit dem VXD Endflansch leitend verbunden
Max-Planck-Institut für Physik
(Werner-Heisenberg-Institut)
München
BELLE-II-PXD
PXD-Detektor
PatchPanel
PP Bestückungszeichnung (Vorschlag 16.1.2018)
(Rev. 15.7)
(Übersicht zu Lötungen, Ground und Zugentlastungen nach Infinibandsystem)
106-015900-012.idw