

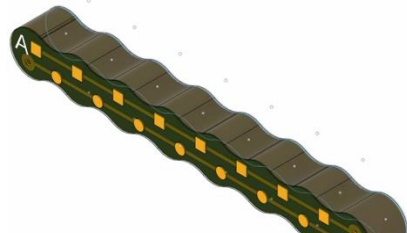
WP2-3 Update

A. Burdyko, D. Falchieri and R. Santoro,

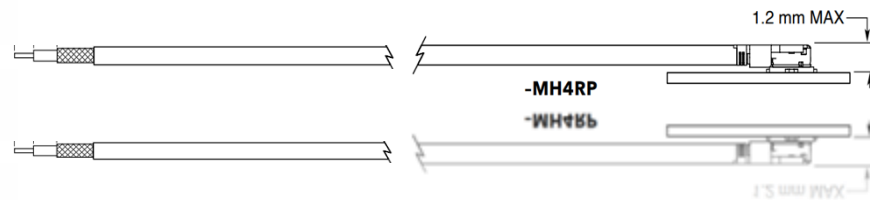


Mechanical integration and cabling of the Highly granular modules

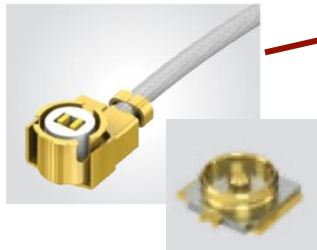
mini FE-board with integrated grouping (8 SiPMs)



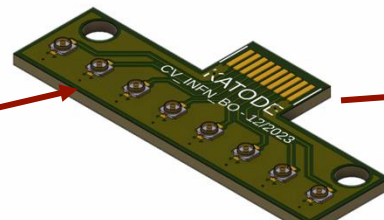
MH081: shielded micro-coax RF cables from Samtec



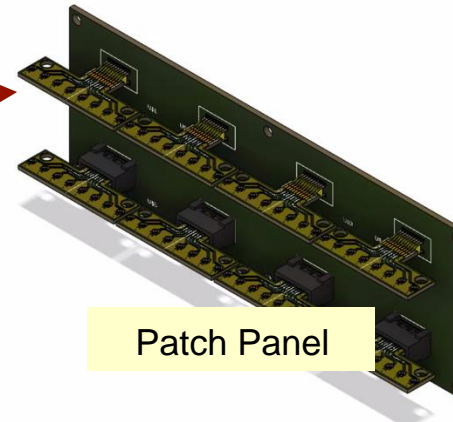
SiPM bar mounted on the front and two-pin cable on the back



connectors fitting into the PCB holes

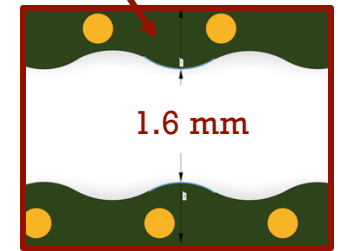
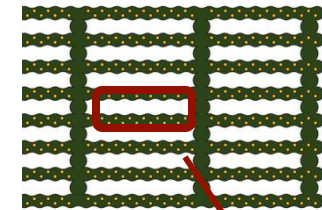


Bridge board: serves 8 SiPM-bars



Patch Panel

Large FE-board equipped with 16 SiPM-bars



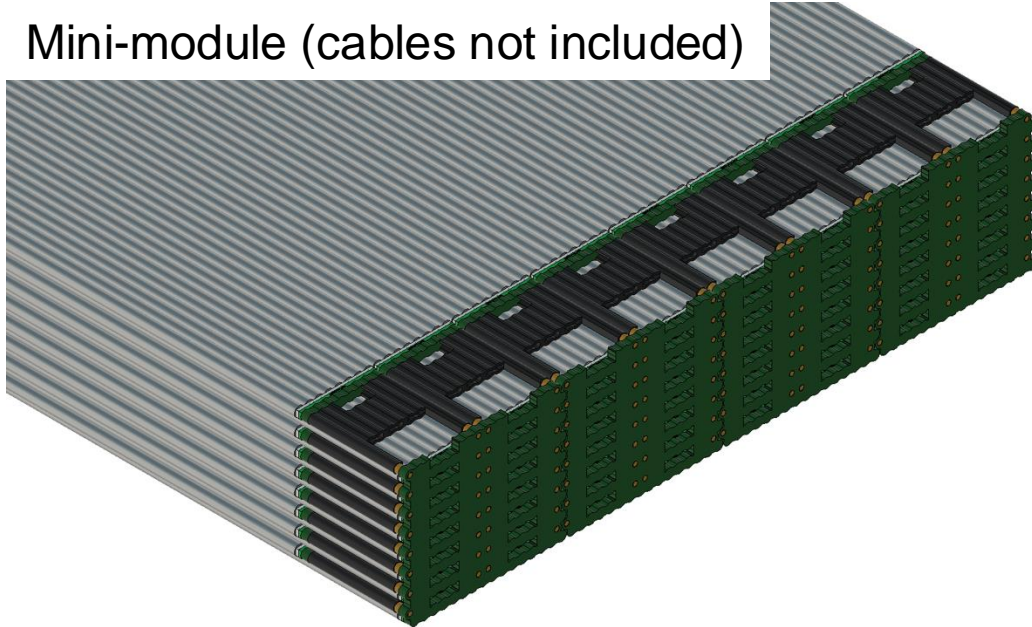
A5202-Board: serves half-minimodule



Highly granular module: Integration

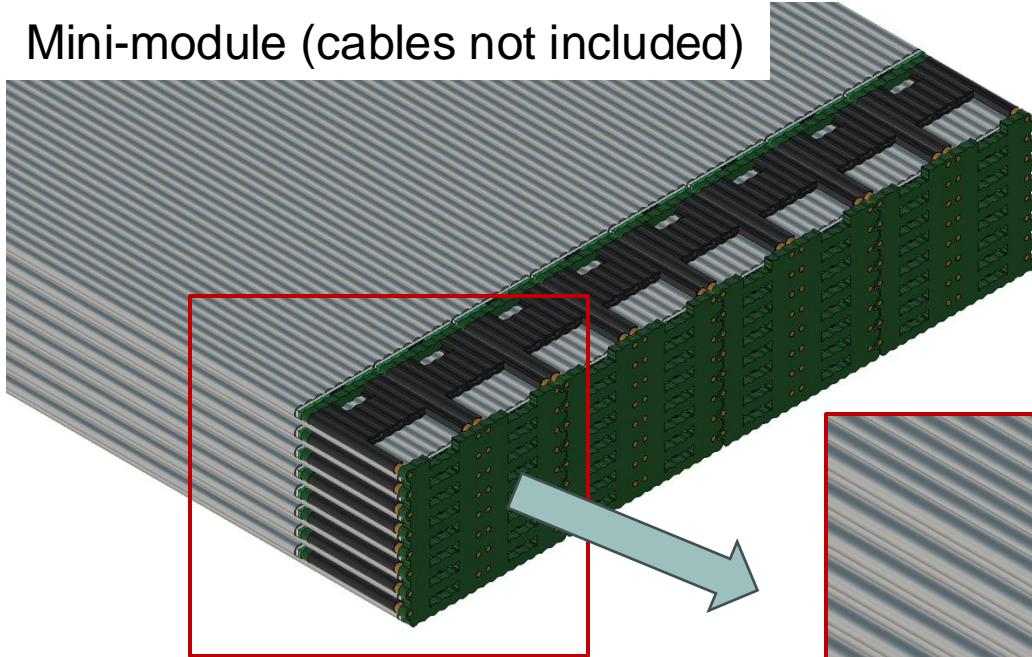


Mini-module (cables not included)



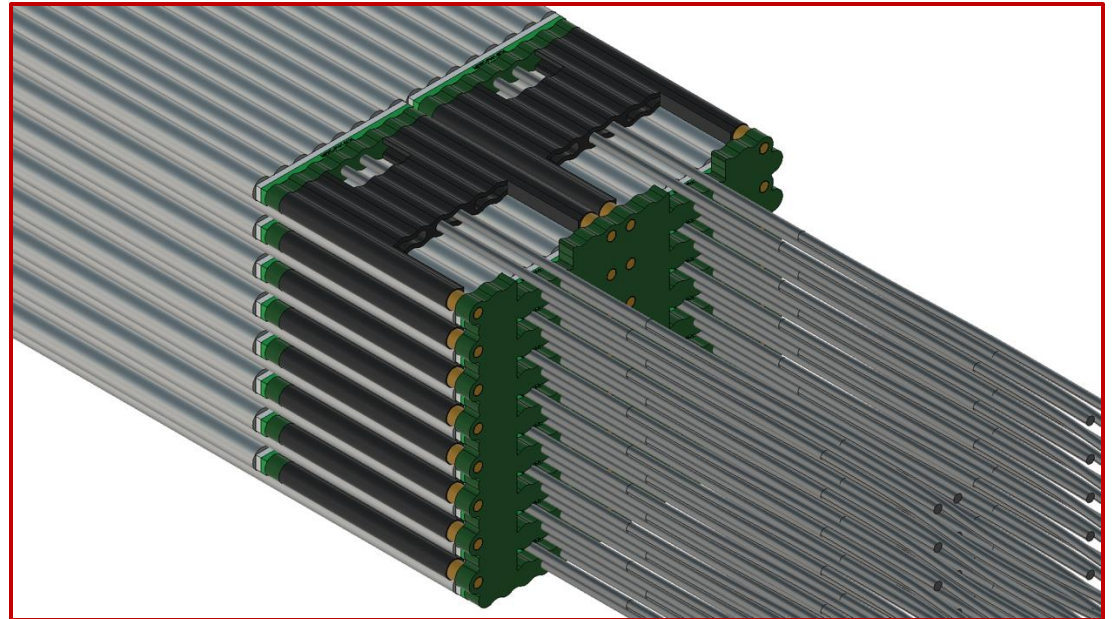
Highly granular module: Integration

Mini-module (cables not included)

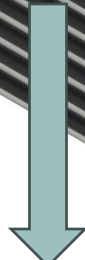
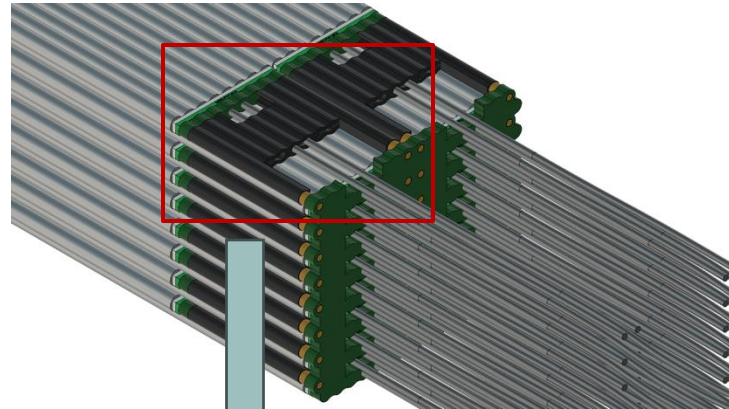


$\frac{1}{4}$ of a mini-module

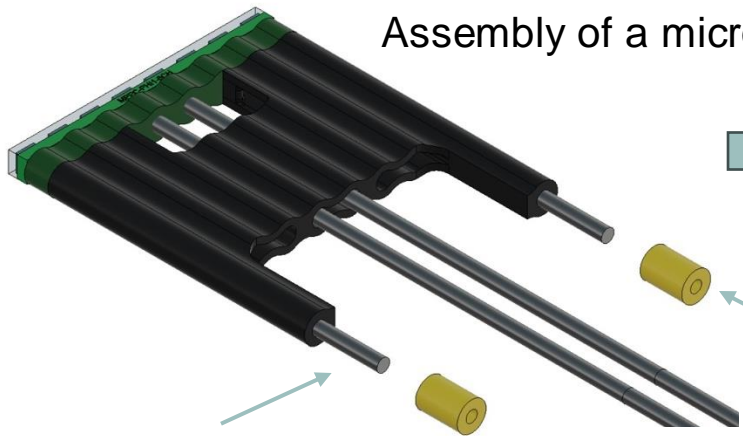
- 16 micro-pcb (1 SiPM module each)
- 1 macro-pcb (16 SiPM modules)
 - Alignment pins
 - Support structure with metal rods



Highly granular module integration



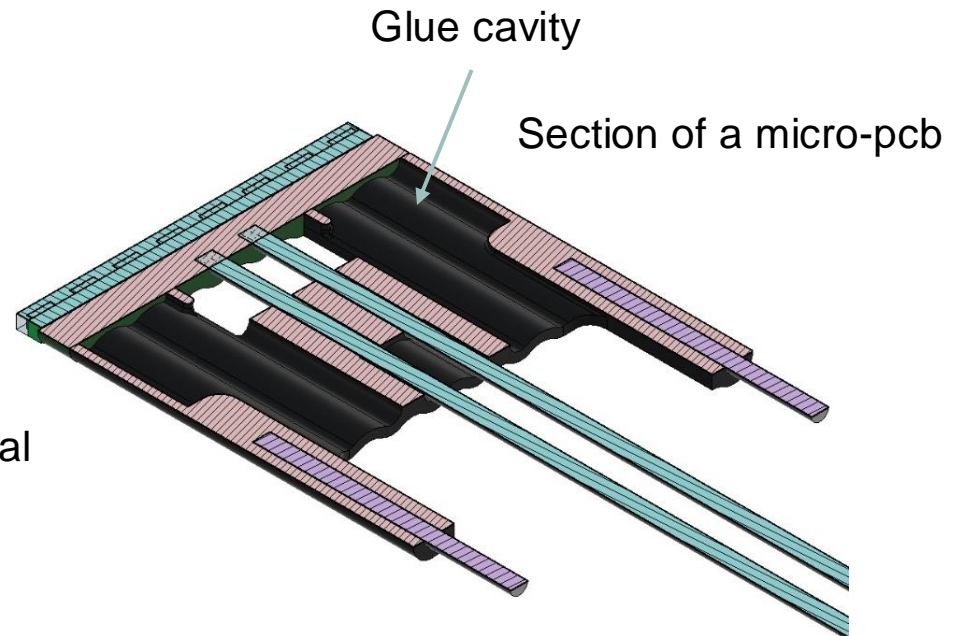
Assembly of a micro-pcb



Metal rod

Coaxial cables

Soft material

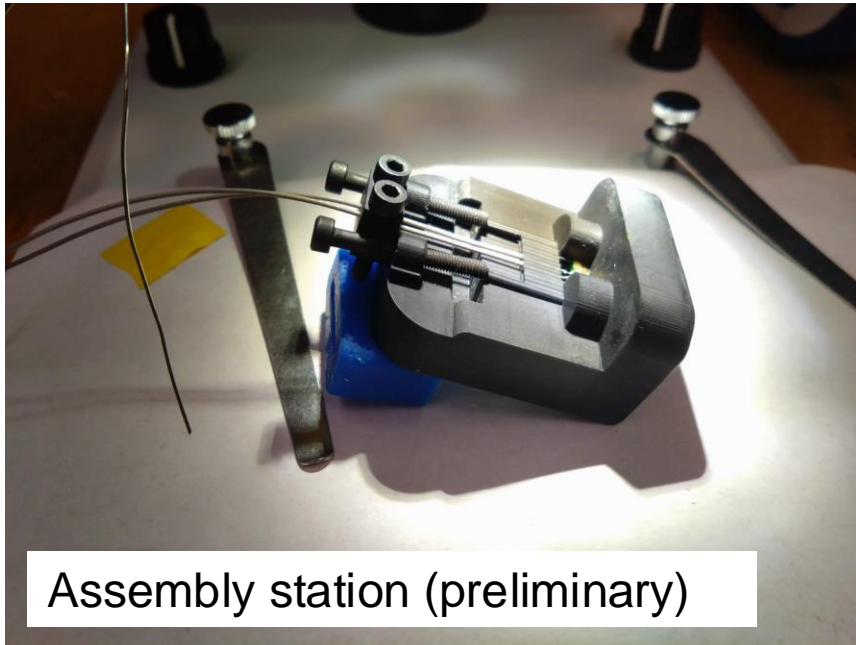


Glue cavity

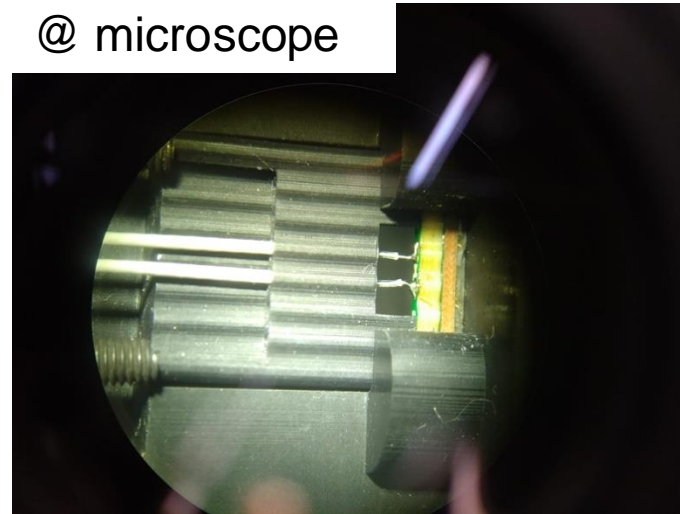
Section of a micro-pcb

Assembly station

- ❑ Still room for improvement, but we are progressing!

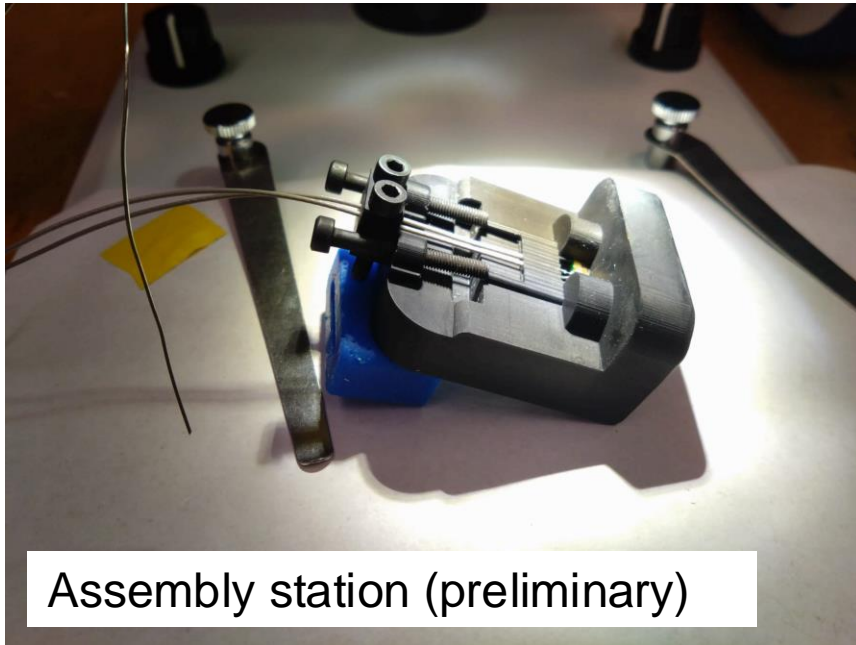


@ microscope

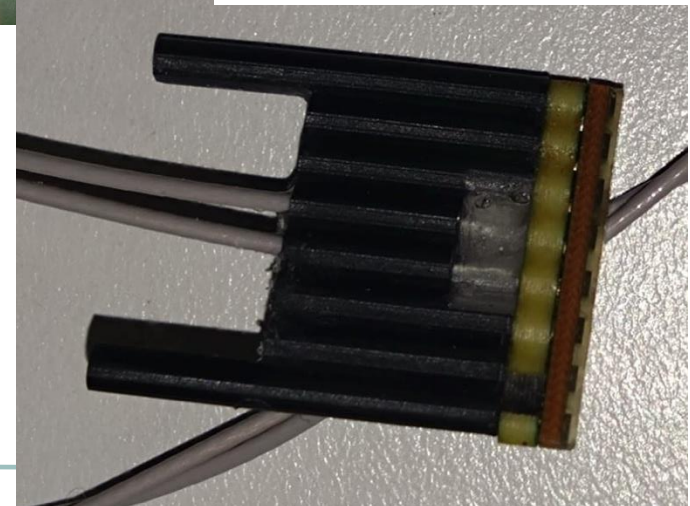
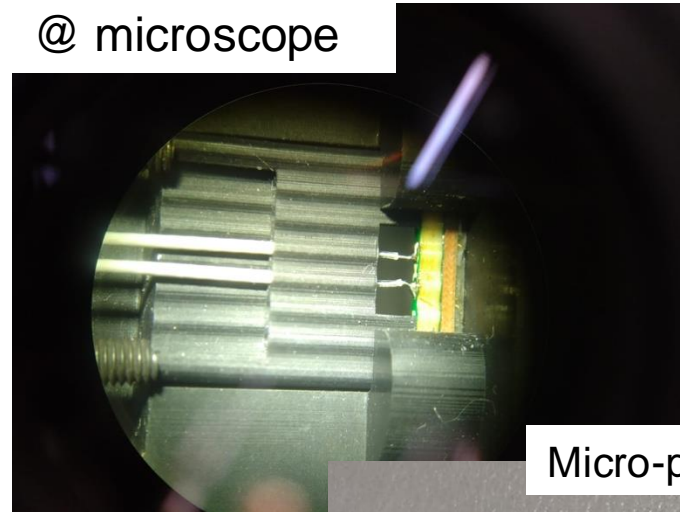


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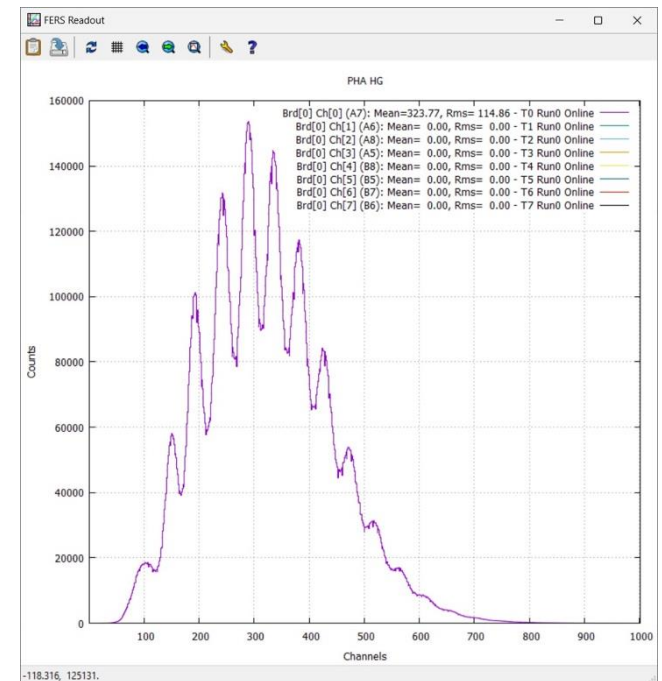
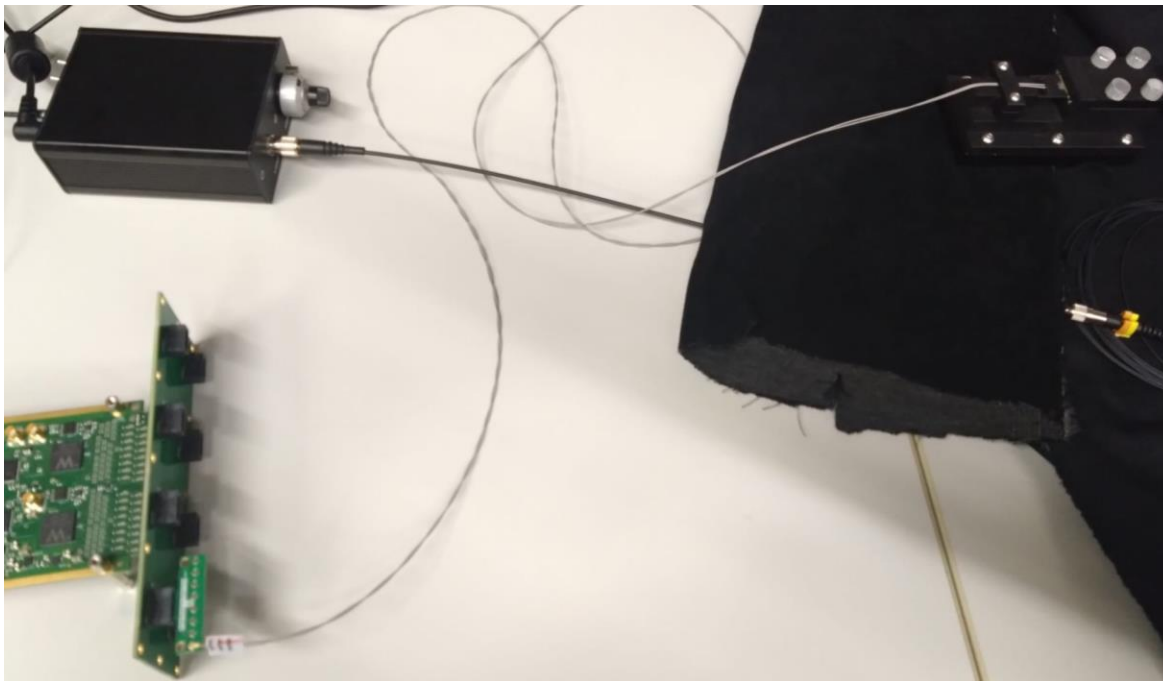


@ microscope



Micro pcb qualification

- ❑ 15 mu pitch (@ 5V over) with grouping and final components!
 - ❑ SiPM bar reworked from old assembly



- ❑ Results from 10 mu pitch will come soon

Components delivery and production



- ❑ SiPMs
 - ❑ 15mu pitch: 572/672 (delivered)
 - ❑ expected delivery time for the missing 100: Dec2024
 - ❑ 10mu pitch: 672/672 (delivered)
- ❑ PCB design and production
 - ❑ Micro-pcb: ready for production
 - ❑ Macro-pcb: ready for production
 - ❑ Patch panel: ready for production
 - ❑ Bridge board: ready for production
- ❑ We are in contact with SCEN for the full production
 - ❑ Full order to be finalized by the end of this year

Samtec saga



- ❑ We need 3000 cables (INFN) and 3000 pcb-connectors (SCEN)
- ❑ Offers @ Feb24
 - ❑ 1.95 euro / cable (qt 3000)
 - ❑ 0.8 euro / pcb-connector (qt 3000)
- ❑ Offers @ March24 (prototypes for electrical qualification)
 - ❑ 2.65 euro / cable (qt 200) -> expected
 - ❑ 0.8 euro / pcb-connector (qt 50) -> better than expected
- ❑ Final offers @ Sept24 (ready for production)
 - ❑ 5.5 euro / cable (qt 3000) -> unbelievable!
 - ❑ ?? / pcb-connector (SCEN will contact Samtec)
- ❑ Actions:
 - ❑ We had immediately a meeting with samtec to investigate the situation
 - ❑ Alternatives under study

Samtec saga



- ❑ We are waiting for the final offer from Samtec
- ❑ 4 additional companies already contacted
 - ❑ HIROSE
 - ❑ I-PEX
 - ❑ MOLEX
 - ❑ Lighthorse (assembly company with I-PEX cables)
- ❑ HIROSE and I-PEX have alternatives mechanically compatible with our specs, electrical quality to be assess
- ❑ MOLEX has similar solutions, to be checked
- ❑ We are in the process of getting offers from all of them
 - ❑ Lighthorse: 4.05 USD/ cable (qt 3000) -> 3.66 euro (as of today!)