UNIVERSITY OF BIRMINGHAM

ePIC UK

FPC Interface Board update

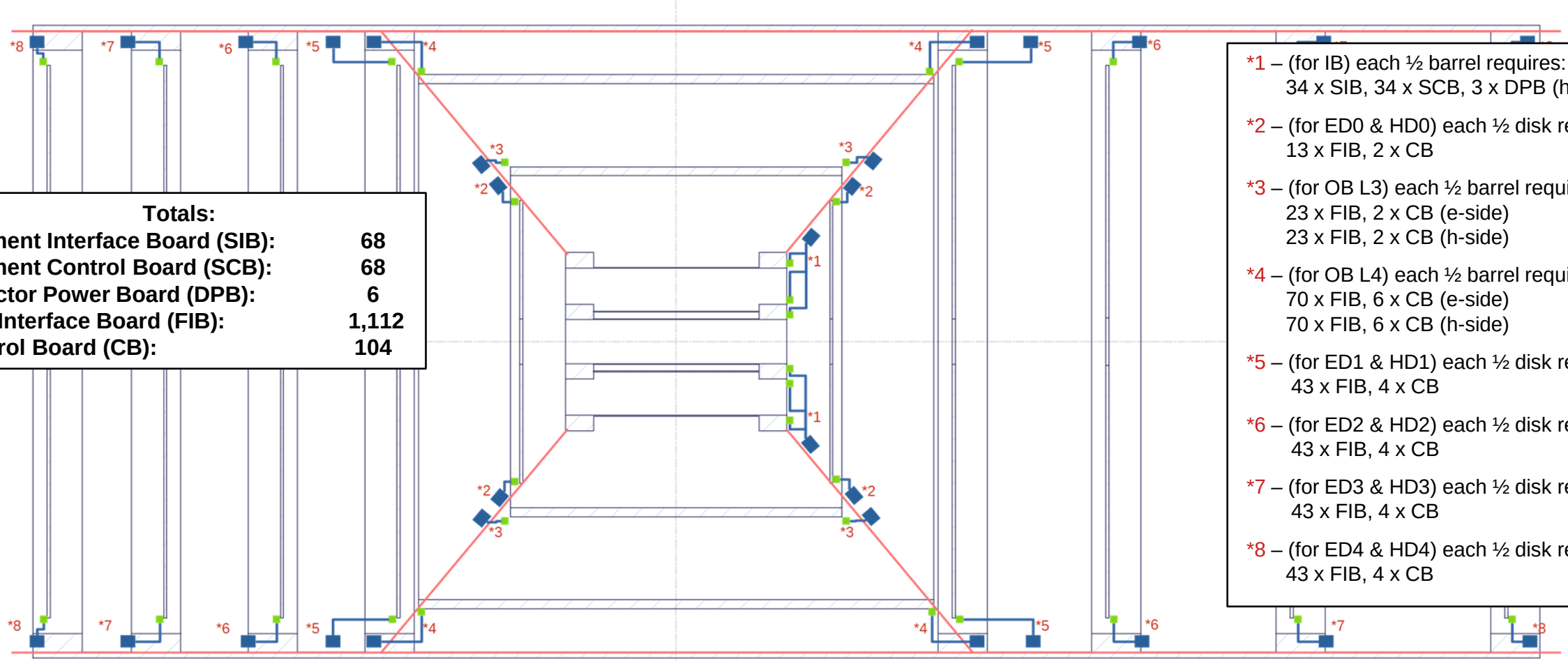
James Glover

EIC-UK WP1 meeting

Wed, 8th October 2025

Approx SVT RDO board locations

Work in progress



Totals:	
Segment Interface Board (SIB):	**68**
Segment Control Board (SCB):	**68**
Detector Power Board (DPB):	**6**
FPC Interface Board (FIB):	**1,112**
Control Board (CB):	**104**

*1 – (for IB) each ½ barrel requires:
34 x SIB, 34 x SCB, 3 x DPB (h-side only)

*2 – (for ED0 & HD0) each ½ disk requires:
13 x FIB, 2 x CB

*3 – (for OB L3) each ½ barrel requires:
23 x FIB, 2 x CB (e-side)
23 x FIB, 2 x CB (h-side)

*4 – (for OB L4) each ½ barrel requires:
70 x FIB, 6 x CB (e-side)
70 x FIB, 6 x CB (h-side)

*5 – (for ED1 & HD1) each ½ disk requires:
43 x FIB, 4 x CB

*6 – (for ED2 & HD2) each ½ disk requires:
43 x FIB, 4 x CB

*7 – (for ED3 & HD3) each ½ disk requires:
43 x FIB, 4 x CB

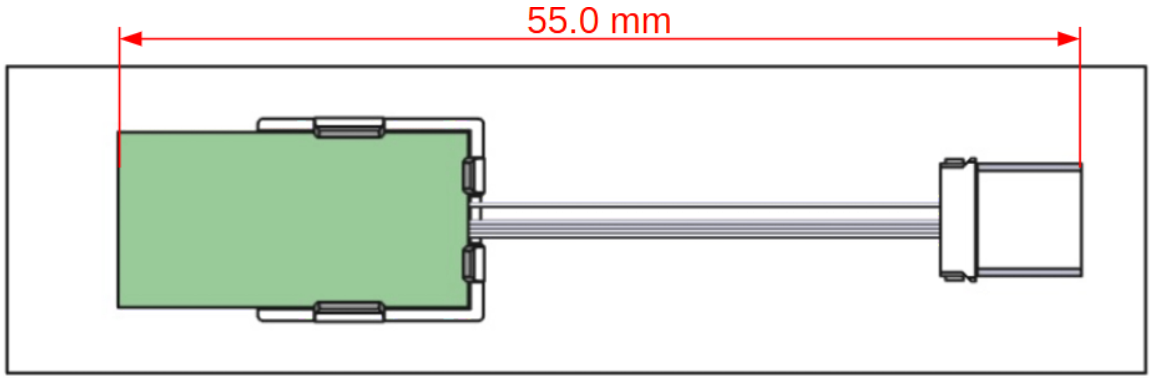
*8 – (for ED4 & HD4) each ½ disk requires:
43 x FIB, 4 x CB

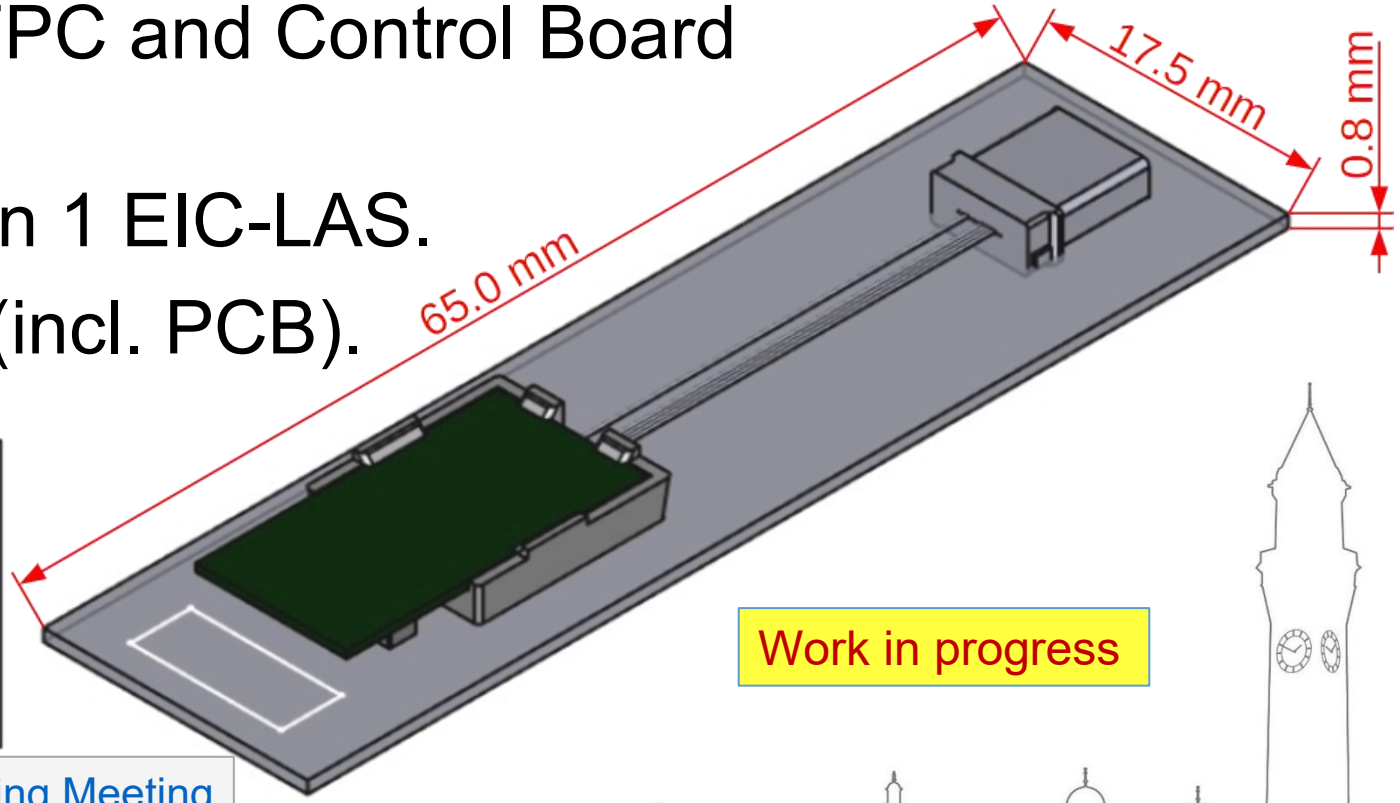
As reported in the Stony Brook Working Meeting

Carbon fibre support structure (tube and cone)
Electronics boards (Interface Boards)
Electronics boards (Control Boards/Power Boards)

Approximate FIB dimensions

- Shortest possible total length (5.5 cm) that CERN will produce.
- Prevent damage to VTRx+ pigtail, by mounting total length on the FIB.
- Allow space to bond/solder FPC and Control Board connections to FIB.
- Keep the board narrower than 1 EIC-LAS.
- ~4 mm total package height (incl. PCB).





Work in progress

As reported in the Stony Brook Working Meeting

Basic FIB volume (for CAD models)

Already got larger, to accommodate the:

- Cut-out for the MT connector (and have extra PCB area for a connector clamp).
- ±2.5 mm of fibre length adjustment (the tolerance status by CERN).

Inspiration taken from ITS3's SIB (Segment Interface Board) design.

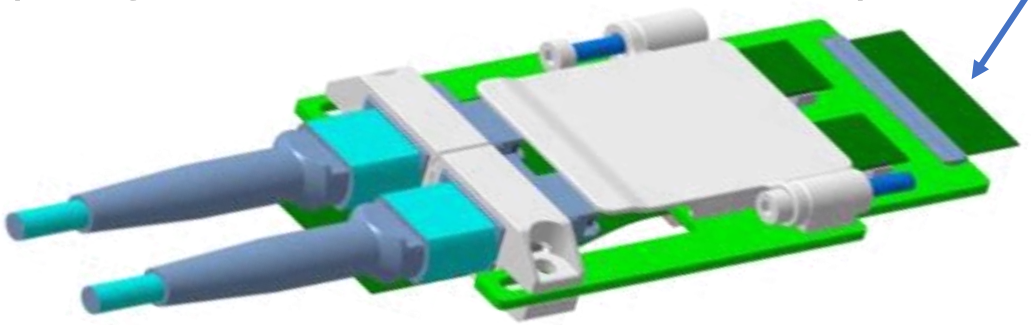
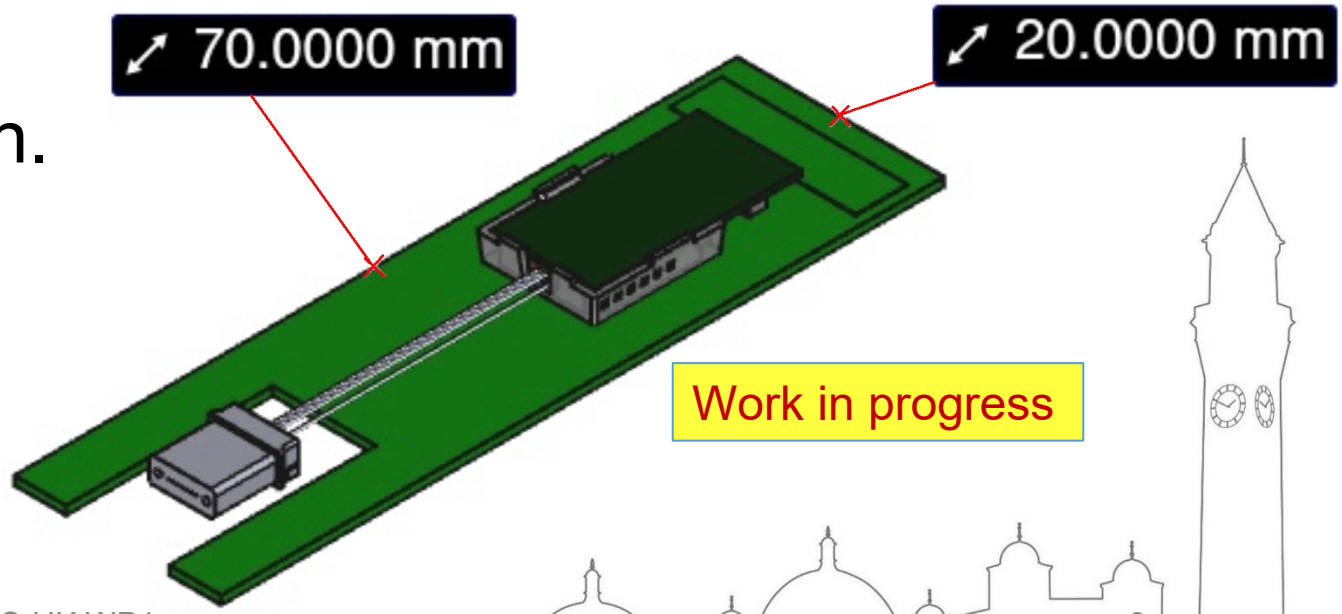


Image from ITS3-WP5 meeting



Work in progress

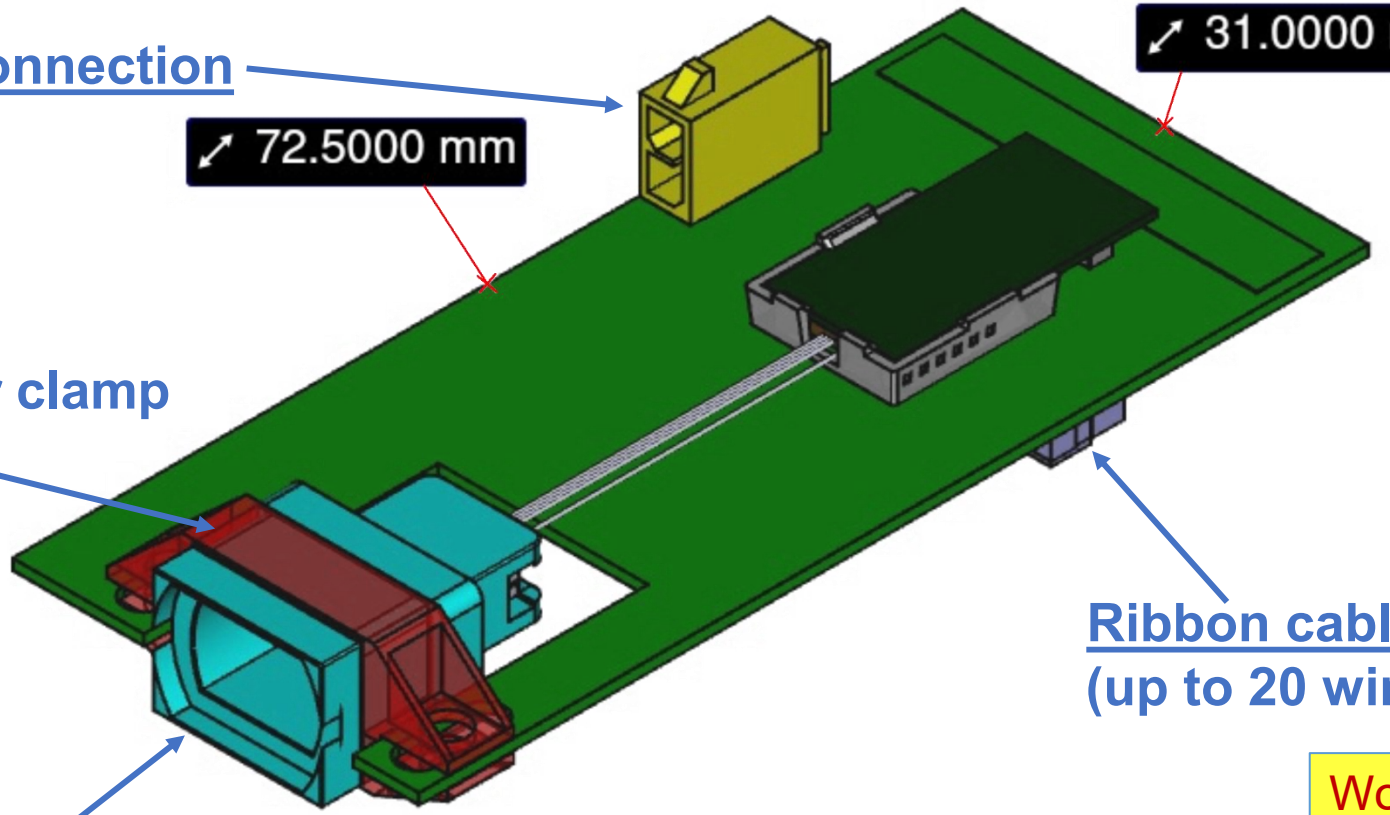
Additions to the design

Additional elements needed to be included:

- Electrical connections from the Control Board (CB):
  - 2.5 V and 1.2 V power for the VTRx+ → 3 to 6 wires.
  - I^2C for the VTRx+ → 2 wires (if GND from power lines).
  - Reset and Disable line for the laser driver → 2 wires.
  - S/Cs for the FPC/EIC-LAS (via the AncASIC) → 3 wires.
- Serial powering lines (directly from the current source).
- MT to MTP adapter (for OTS fibre harnesses to be used).
- Optional CB to FIB connections:
  - VTRx+ RSSI current, VTRx+ thermistor, 1.2 and 2.5V sense wires.

Current FIB

- Much larger!



Current source connection

Sliding MTP adapter clamp

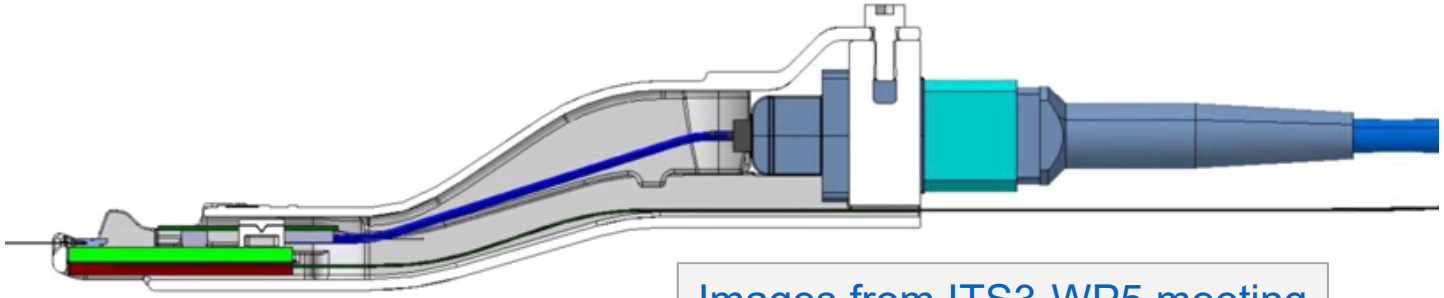
Ribbon cable connector
(up to 20 wires, 30AWG)

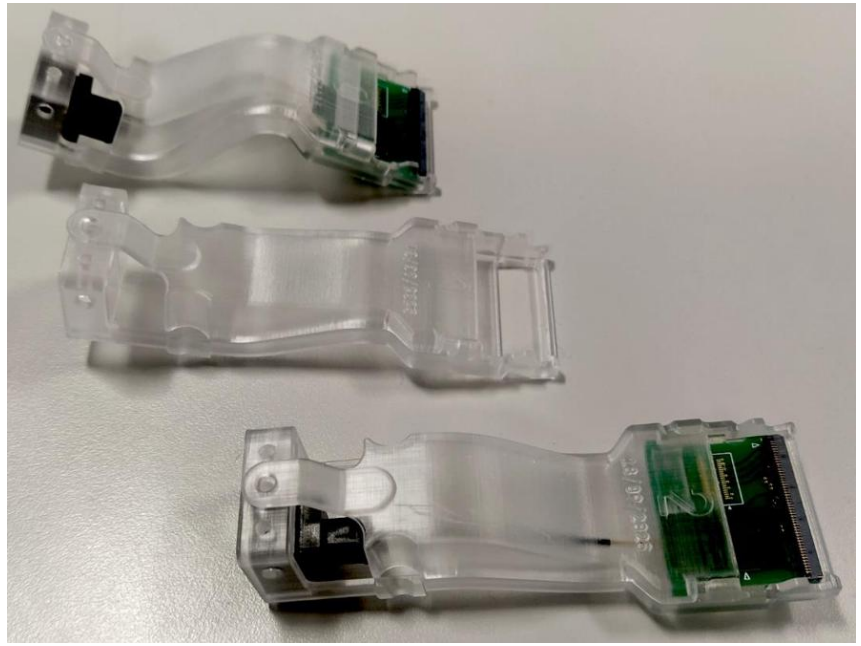
Work in progress

MT-to-MTP adapter

Possible optimisations

- Board width enables “Sliding MTP adapter clamp” and “Current source connection” to sit side-by-side.
  - Moving “Current source connection” back, beside the VTRx+ could enable board to narrow (2-5 mm).
- Board length is to support full length of VTRx+ fibre pigtail.
  - Custom 3D-printed fibre enclosure/MTP holder could reduce PCB footprint (similar to newer ITS3 SIB designs).





Images from ITS3-WP5 meeting

Summary

- Update to the FIBs are being considered.
- Considerations for actual # of connections needed per FIB.
- Adding realism and connectors.
- FIB is getting bulkier.

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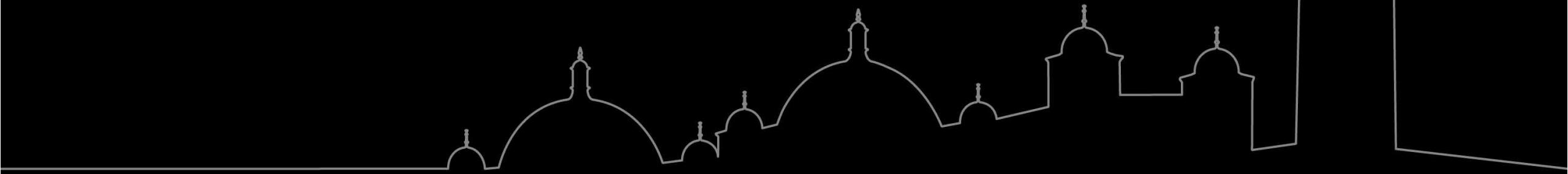
Thank you very much!

Any questions?



Additional (support) slides