

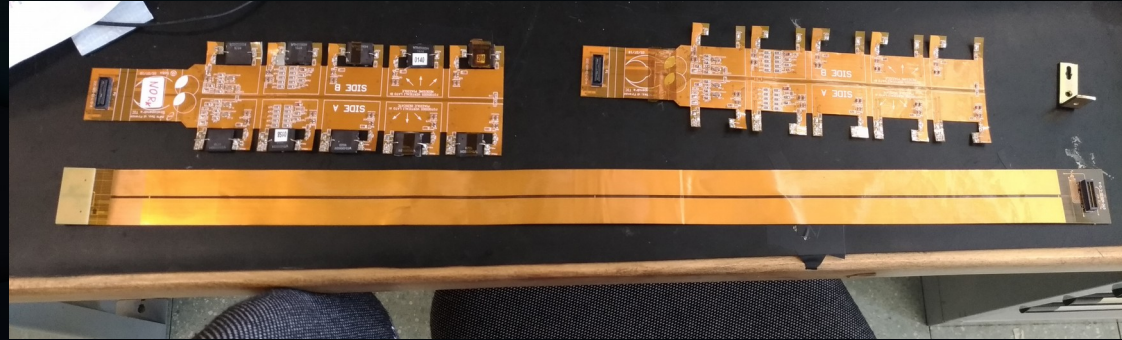
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Weight of PD readout system

Lorenzo Pacini for Florence INFN group.

Weight measurements

- Short kapton cable (connecting 2 columns, 5 cubes per column, 10 PD channels per column) + one connector: 11.1 g
- Blue samtec cable + two connectors: 12 g
- VTH2090 + two small cables: 1.7g
- Front-end HIDRA boards (16*4 channels, 15*4 channels used for PDs, 4 channels for CN): 231g
- Long + short kapton cables: 45g ($\sim 11\text{g} \times 4$)



Weight calculations

- The monolithic package weight ~ VTH2090 weight:
 - 1.7g each cube, $16000 \times 1.7\text{g} \sim 13\text{kg}$ total.
- Long capton cable, each channel 45/20 ~ 2.2g, $16000 \times 2.2 \sim 35.5 \text{ kg}$ tota.
- Blue cable: $12/20 = 0.6\text{g}$ each channel, $16000 \times 0.6 = 9.6\text{kg}$ total.
- HIDRA boards: $213/60 = 3.5\text{g}$ each channel, 57kg total. (Based on the current version of the boards, can we use the next version (24 channels per chip??))
- Total for each cube (2 channels): $1.7 + 2.2 \times 2 + 0.6 \times 2 + 3.55 \times 2 = 14.4\text{g}$
- Additional weight for logics, power supplies: 10 kg (~ 50 TROC2 boards)
- Total = $8000 \times 14.4 = 115 + 10 = 125 \text{ kg}$

Questions

- Mechanical supporting structures for front-end and logics/power-supplies boards is not taken into account.
 - It will be defined with IHEP colleagues, can we postpone this estimation?
- A over estimate calculation based on Sergio R. indications:
 - Typical space-qualified box for a typical board ~ 0.5 kg
 - We will have 16000/60 boards ~ 250 boards $\rightarrow 125$ kg for the mechaincs
- Conclusions (by applying some safety margin) for IHEP:
 - Total for each cube (2 channels): < 20 g
 - Additional weight which does not strongly depends on the number of channel: < 15 kg
 - Note: mechanical structures for boards is not included in this computations.