

Sensor Arrangements (Mechanics)

Bill Cooper

Potential Module Varieties

Coord measured
 X
 Y

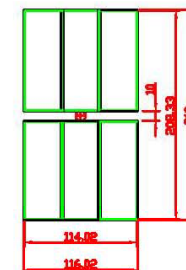
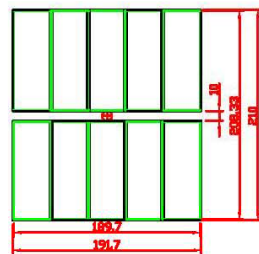
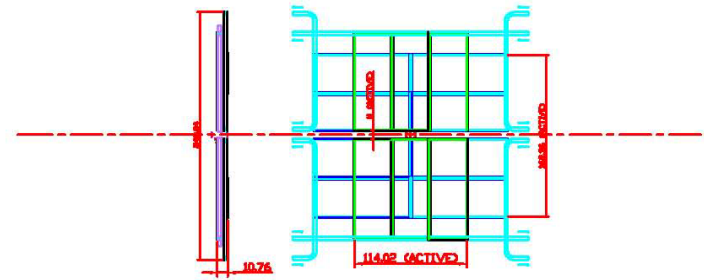
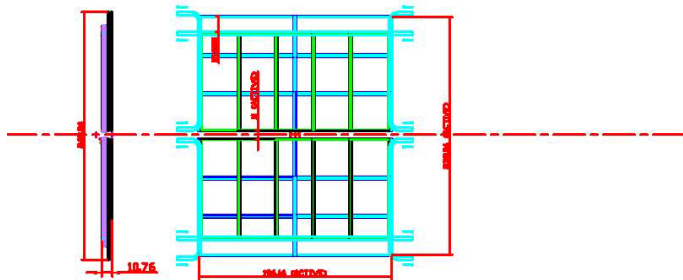
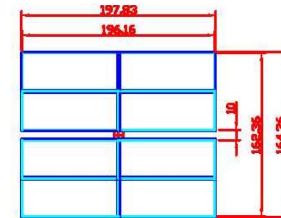
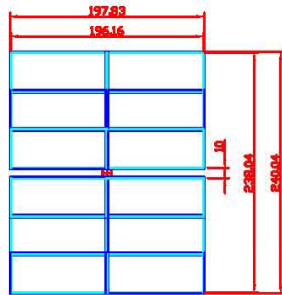
No. sensors
 10
 12

Coord measured
 X
 Y

No. sensors
 6
 8

A

B

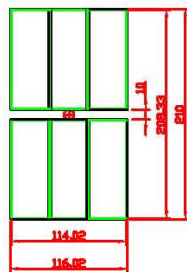
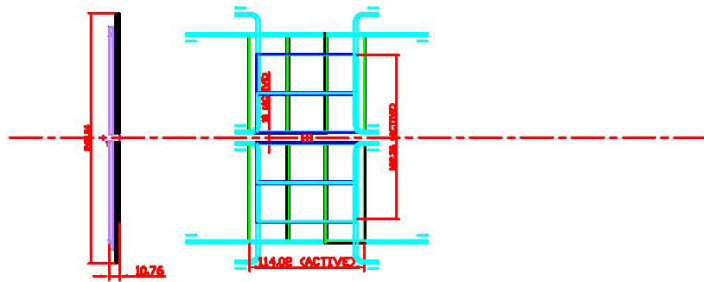
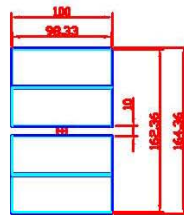


Potential Module Varieties

Coord measured
X
Y

No. sensors
6
4

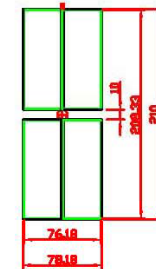
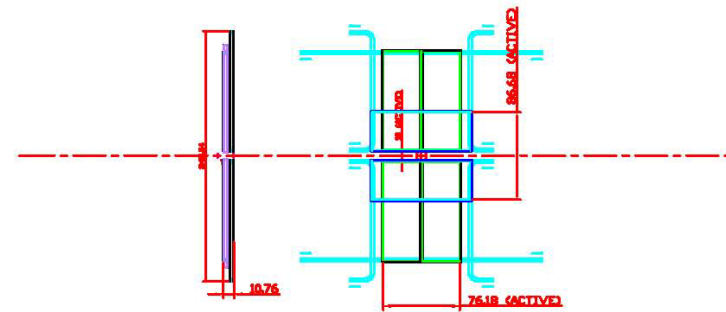
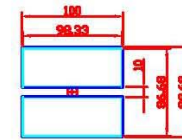
C



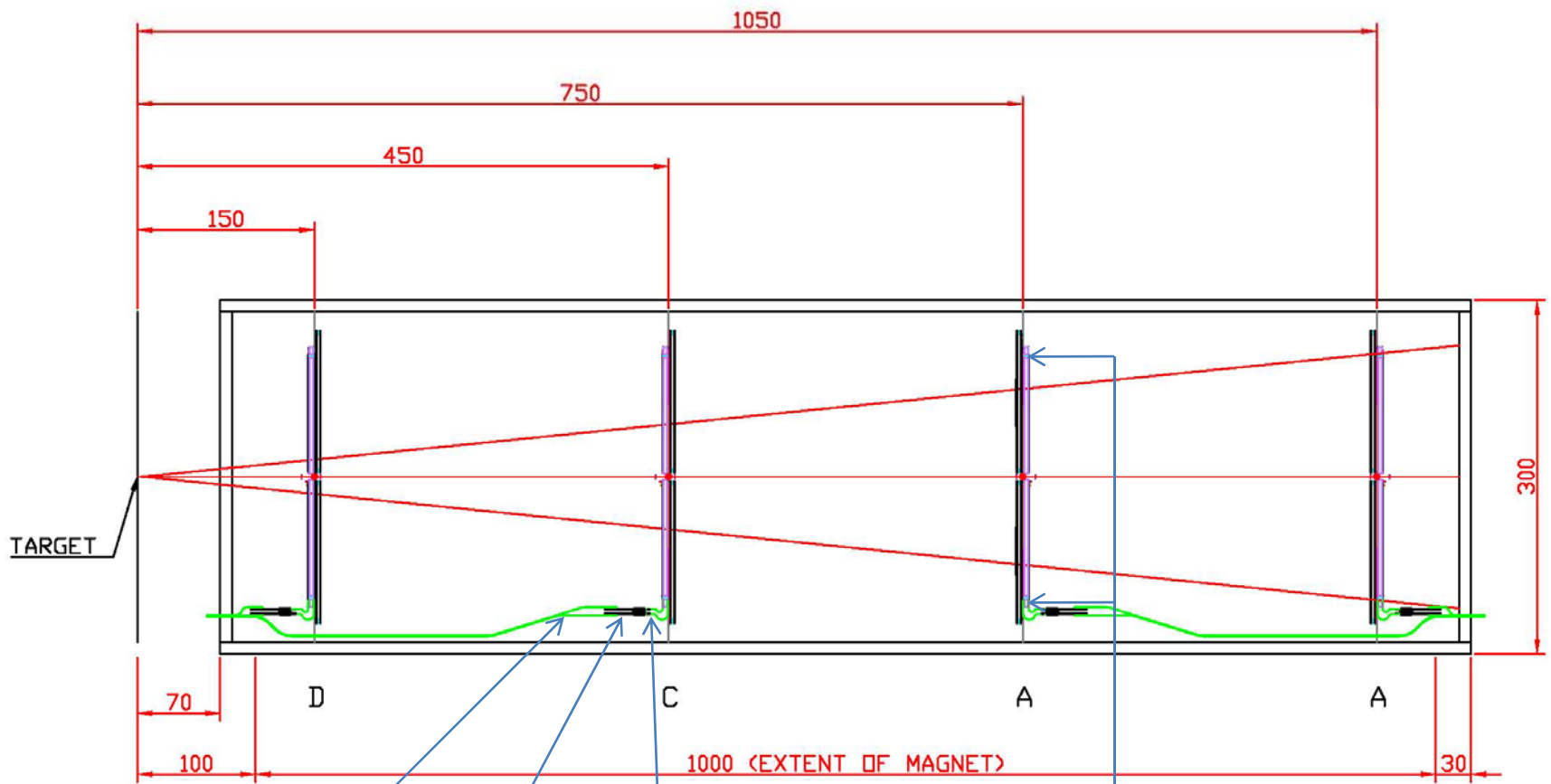
Coord measured
X
Y

No. sensors
4
2

D



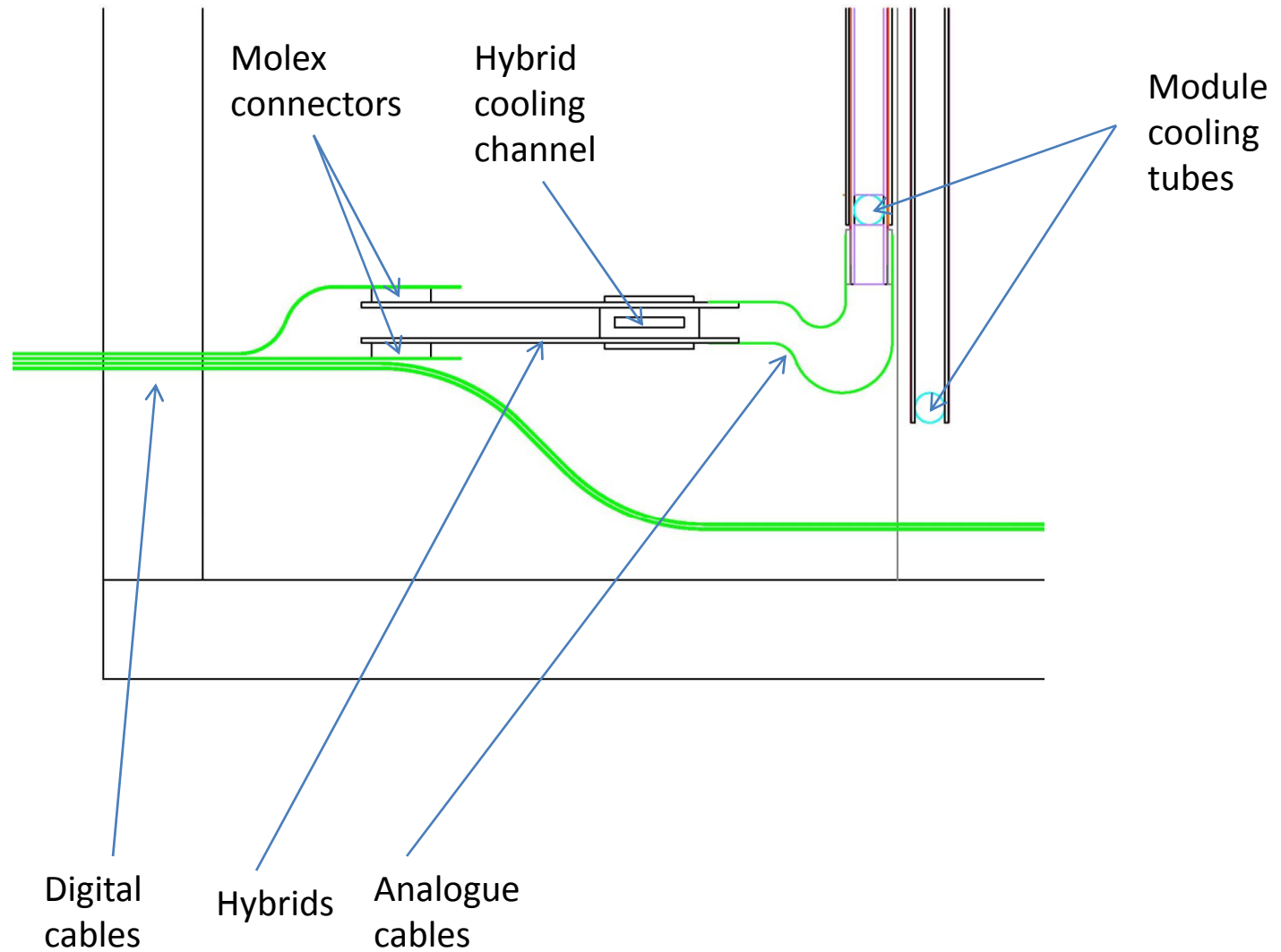
Potential Module Choices / Locations



Digital cables
Hybrids
Analogue cables

Hybrids in this region (4 locations along the beam line) lie parallel to the drawing sheet and service modules that measure elevation

Hybrids / cables



Potential Module Choices

- Two sets of modules are inserted from upstream, two from downstream.
- Modules plug onto leaf spring mounts which engage cooling tubes.
- Hybrids are supported by modules.
- Cooling tube sizing is roughly correct for ethylene glycol – water cooling.
 - In that case, cooling of modules and hybrids would be done in parallel.
 - 1 mm x 7 mm rectangular channel for hybrids
 - 3 mm OD round tube for modules
- If evaporative CO₂ cooling were used, hybrids and modules should probably be cooled in series, with modules coming last (lower temperature).
 - All cooling tubes would be round.

Issues

- Need to determine hybrid size (length drawn = 38 mm)
- Need hybrid power dissipation
- Need to design digital and analogue cables and choose connectors
- We should consider whether it is acceptable for cables to emerge from opposite ends of the magnet.
- Need to agree on positions along the beam line and how many sensors are at each position.
- Leaf spring mounts need to be designed.
 - Assumption: each module would be positioned by four springs.
- Need to design a reliable system for adjusting module positions, that is, deflecting leaf springs.