

FST services

Version 1: 3/23/2020

The FST consists of 3 disks/modules each with 12 wedges.

Signal cables

Each wedge has one signal cable (purple) that connects to the T-boards to which two connector serving inner and outer hybrid is connected

12 cables with T-board per sector.

The cable outer diameter is 0.415" (10.54 mm).

The cables supply low voltage to chips on hybrid, Silicon sensor bias voltage (0-200V)

Cable bending radius requirements for mounting

(source Gerard Visser 3/23/2020)

"I think 6 cm is a pretty good value for minimum (static) bend radius for the FST purple cable. I base this statement on playing with a sample here just now. It could be bent tighter if there is a real need to. 3 cm doesn't look/feel too bad. However, I think it would be best to stick to 6 cm or larger if we can.

In places where the cable may be flexed repeatedly in installation/removal of the detector, if we can keep a yet larger minimum radius of 12 cm it would probably be better to do so. I expect such places are toward the outer regions, that cables near the detector are pretty well strain relieved anyway."

On the T-board cable
(Mike 3/22/2020)

"Just an FYI, I'm pretty sure we will be "flattening" the wire against the board, i.e. against where those four holes are, as that area will be covered by the hybrids I believe. Steve had a picture on Drupal...attached. This is of the V2.0 T-Board with our mock up cable, just to display an estimated height. I believe the cable will also have a similar 90 degree bend where it is strain relieved, but I am not certain."

(see the right hand picture below)

Open questions;

Slack

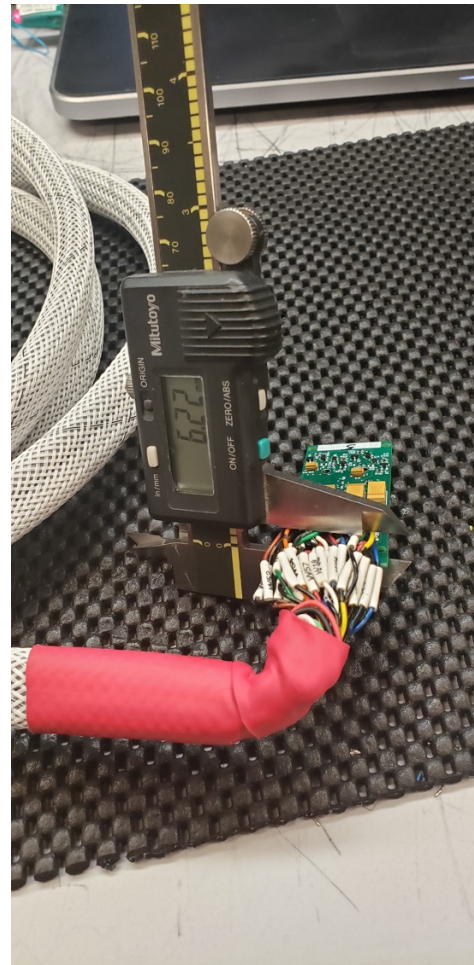
Length

Strain relief

assembly



Figure 1 T-Board and cable



Cooling Tubes

3 wedges are connected together so for each 3 wedges there are one supply and one return line.
i.e. 8 per module.

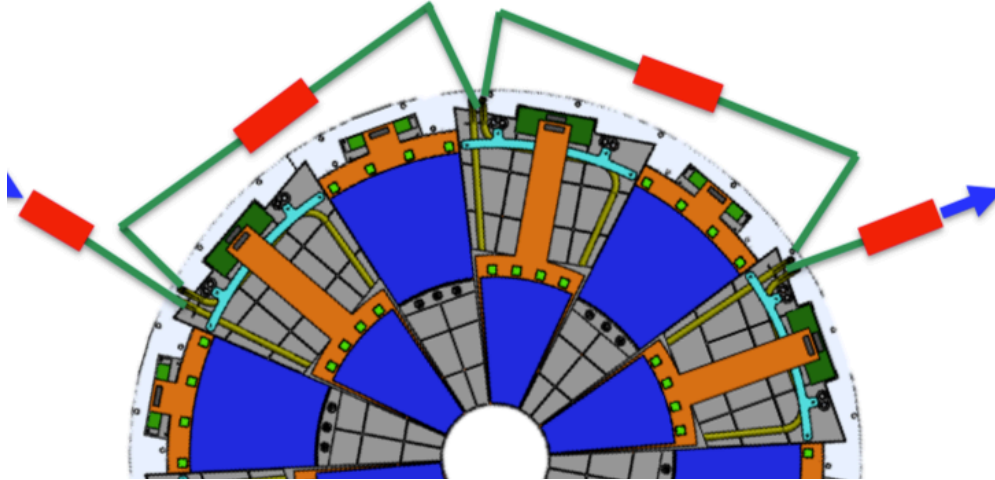


Figure 2 schematic cooling on module

For now the cooling lines are soft tubes with diameter ?? , though we do need to consider stainless, and flexible metal tubing near connection points

The cooling tubes have turned bend when they leave the wedge, and alternate wedges point towards and away from the IP; This may pose an issue.

The latest update on solidwork model is at this link

https://drupal.star.bnl.gov/STAR/system/files/HanSheng0324_20.pdf

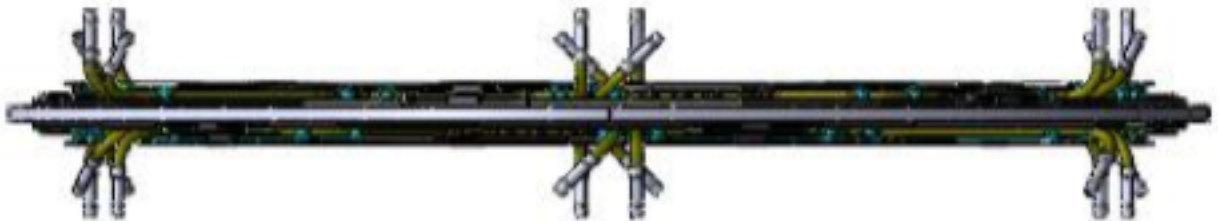


Figure 3 Side view of single module; Note cooling lines

Pole tip space

There has to be space for

- a) 36 patch panel. Need to be mounted insulated, and cooled with chilled water (as far I recall)
 - a. This all exists
- b) 24 cooling manifolds.
 - a. These exists too

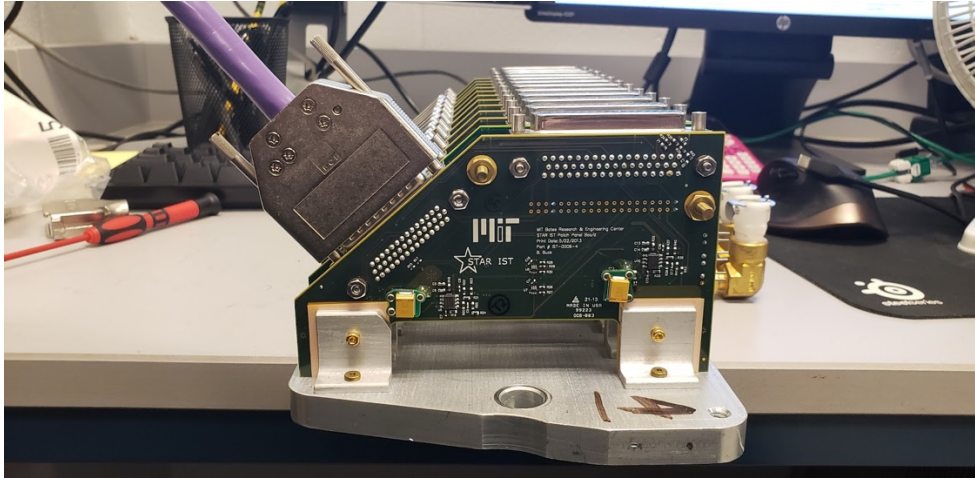


Figure 4 Existing patch panel

To distribute cables, it probably has to be split into smaller units (3*12) would seem good if individual modules all go to same panel; otherwise 18*2 for e.g. up/down distribution.

Service distribution to racks

- Grey cables; cable run
- Cooling lines (stainless) from magnet face manifolds to North platform cooling unit.