

Some brief notes from the meeting to discuss the requirements on Temperature measurements inside the ITk detector.

The meeting took place on Wednesday 19<sup>th</sup> December 2018 at CERN.

The INDICO page can be found at...

<https://indico.cern.ch/event/779577/>

During the meeting there was a strong presence from the Strips community but not pixels (no PL or PE) and no presentation from the Pixels. Representation from PH-DT (Bart and Pedro).

Comments or corrections to these notes are most welcome

Strips agreed conclusions on measurement requirements.

Required temperature sensor Stability +/-0.5K

Strip structures need stability of +1K

Accuracy temperature accuracy +/- 1K

Two wire 25 way connectors are OK

Question: Can we deal with asymmetric instrumentation?

ITk Would VERY strongly prefer a common (across the sub-systems project) two-wire readout solution. A three-wire solution would be a real problem for space and routing.

Georg agreed specifications in the past and was not at the meeting, good to understand where some of the numbers came from in case we are missing anything.

Trade-off between precision and accuracy vs the number of wires

## Pixels

Need to check some of these details with Danilo as the PE but would like to have same accuracy and precisions in Strips and Pixels.

The meeting did not understand the requirement to be able to read temperatures up to 250oC. This is a temperature we believe it is not possible to get on the staves and even if there were a failure, it would only effect the cooling loops closest to the beamline. This needs to be revisited.

We also need to understand the headroom between the proposed minimum coolant temperature and the temperature required on the staves. For the pixels that might drive the a different accurany requiremnt

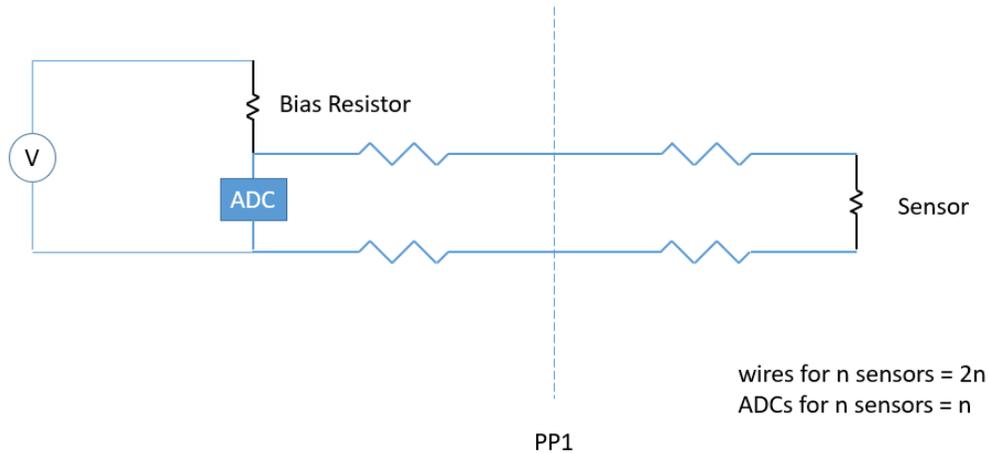
As a groups we as the ITK need to understand what we can realize do with two and three wire readout for standard packaged NTCs (or other comparable two wire sensors). We need to understand the accuracy and precision.

Suggest that the summary of the meeting be presented and discussed at ITk week at the end of January. This was agreed and it should probably be part of a plenary discussion.

BV Nice to get drawings of the pinout and allocation of feedthroughs and understand routing.

At the end of the meeting Peter Philipps mentioned the possibility of using one wire readout using a remote (close to the detector) bias network. This was not discussed in any detail at the meeting but could be presented and discussed during the forthcoming ITk week.

## Two wire readout with ELMB



## “One wire” readout using remote bias network

