U.Uwer

Station and Module Support Frames

Disclaimer: Detailed station and support frame design has started only recently. Therefore don't expect final drawings.

Dowel pins through the precise holes at the module ends are used to support and to position the modules.

Station and Frames in TDR



- 4 stations with 4 layers each
- layers mounted on alu frame
- dowel pins together with precision holes in frame define module position
- independent supports for +x and -x side

no independent movement of stations / layers

Maintenance only from top/bottom



Electronics maintenance from top?



Independent movement of xu and vx layers

A-A



Revised Station Support Design:

Idea: independent quarter stations movable on I-beams

Constraints:

\rightarrow from module assembly

modules are assembled vertically outside hall

\rightarrow from module positioning

- module positioning with dowel pins
- relative position of modules stable in time and reproducible over movements. Time changes: in x<100 microns, in y<1mm, in z<500 microns
- initial relative x position within quarter station better than 500 microns with respect to nominal
- z position of module over full length better than1 mm

 \rightarrow from IT (support)

 \rightarrow from services and maintenance



Translated into 3D CAD Drawings





Problems:

У

Ζ

X

- half modules cannot be easily positioned in x and z: align and glue them on a template
- possible movement / bending of modules in z

Alignment

Alignment procedure based on data with following requirements:

- internal module precision (wires within ±0.1 mm with respect to each other)
 → only few free parameter to describe the absolute module position
- absolute module position within mounted frames after assembly better than 0.5 mm (relative position of dowel pins much better than 0.5mm)
 → exact position of module determined from data
- within moving unit constrain independent variations of z position of individual modules as well as "bending effects" to ±0.5 mm
- limit short-term (weeks) variations of module positions to required accuracy
- RASNIK system to monitor position of "moving units" across movements