

PSI Center for Accelerator Science
and Engineering

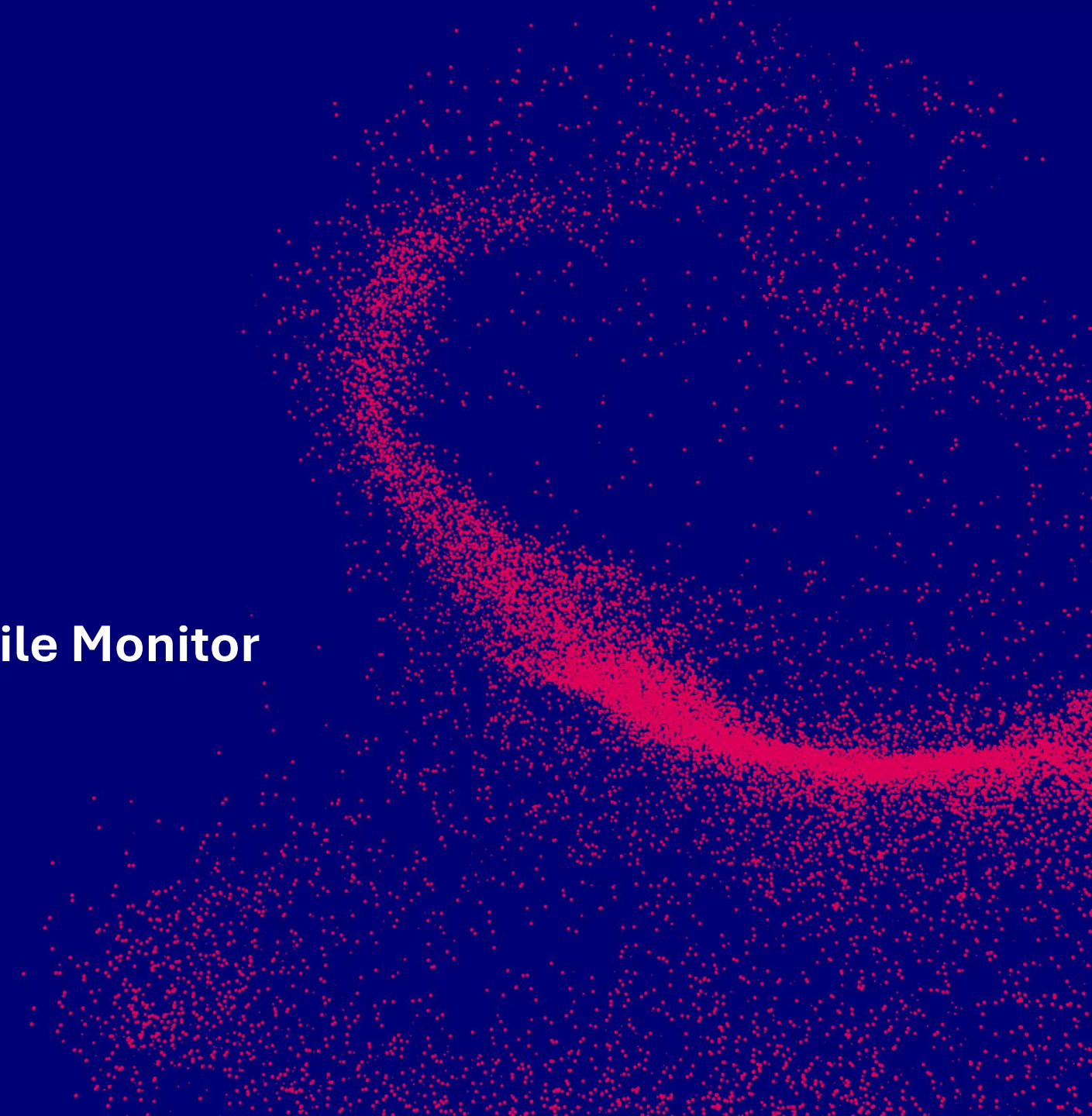
Beamscanner

Kick off – PSI General Beam Profile Monitor

Thomas Rauber

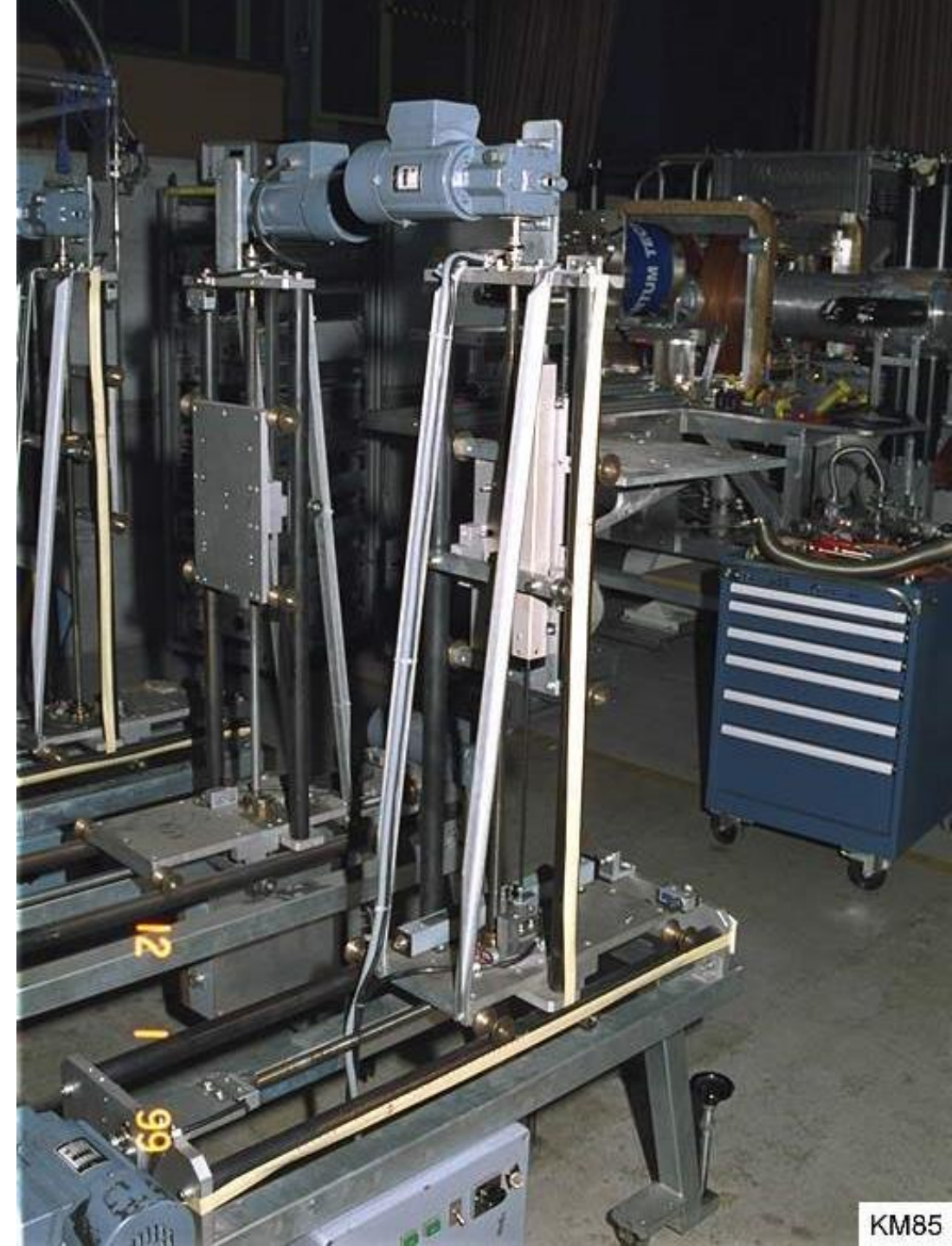
Senior Specialist – Supervisor Proton Channel 590MeV

PSI, 26 January, 2026



Historical scanner XY

- **Slow, but stable, heavy load and no critical electronic.**
- **SCS 1000 remote control, position measurement system.**



Fast scanner XY

Build in 2000

- **PC17634**
- **User: Secondary / PSW: PSIbeam1**
- **Only for small items, no heavy load possible.**
- **Range X 1000mm / Y 700mm**



Scanner XY

Build in 2015

- **PC17633**
- **User: Secondary / PSW: PSIbeam1**
- **Max load official 15kg, depends on the distance to the axis, Mechanical is up to 80kg possible with a distance <25cm possible. The dynamic torque of M_y 208Nm is relevant.**
- **Range X 500mm / Y 500mm**



Scanner XYZ

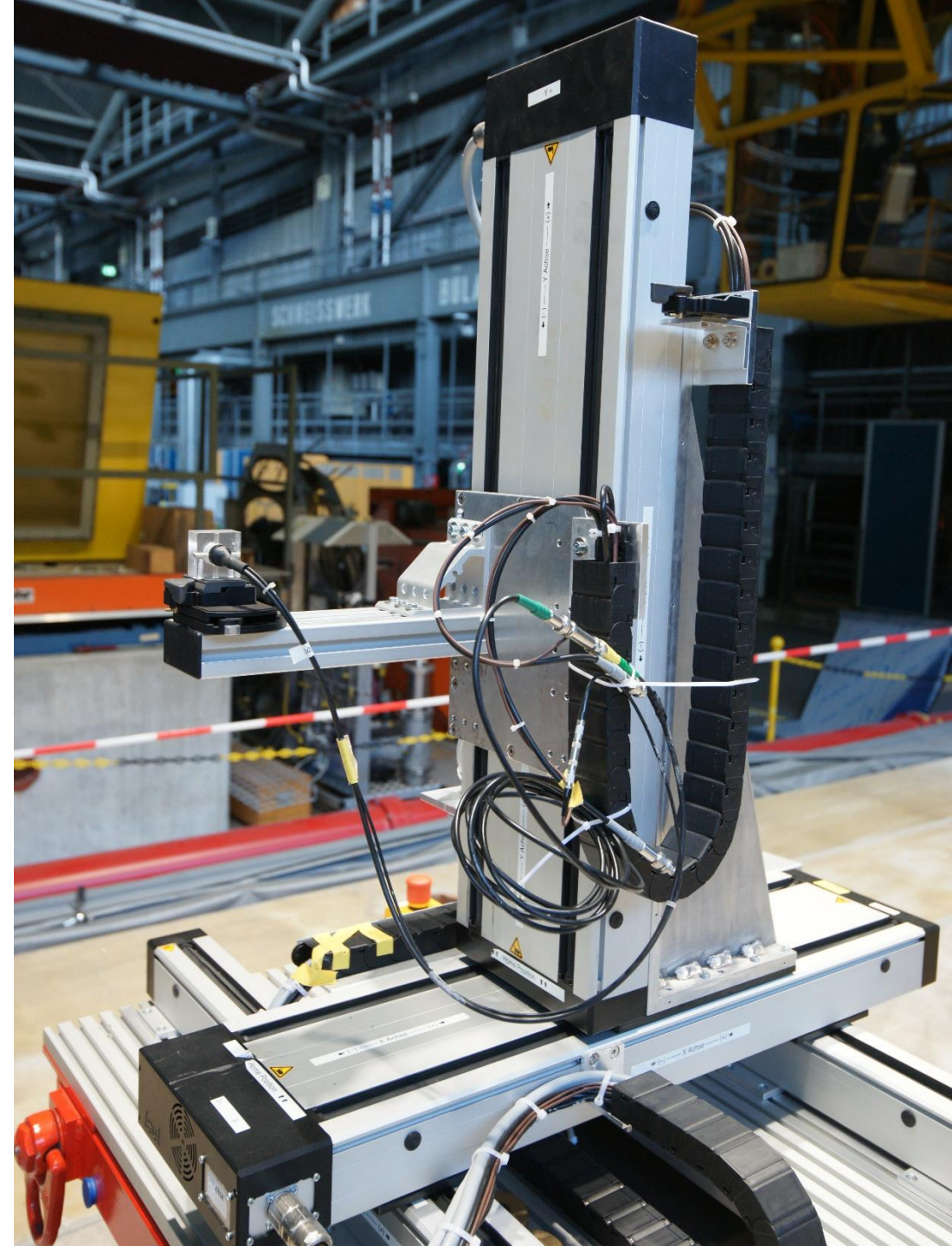
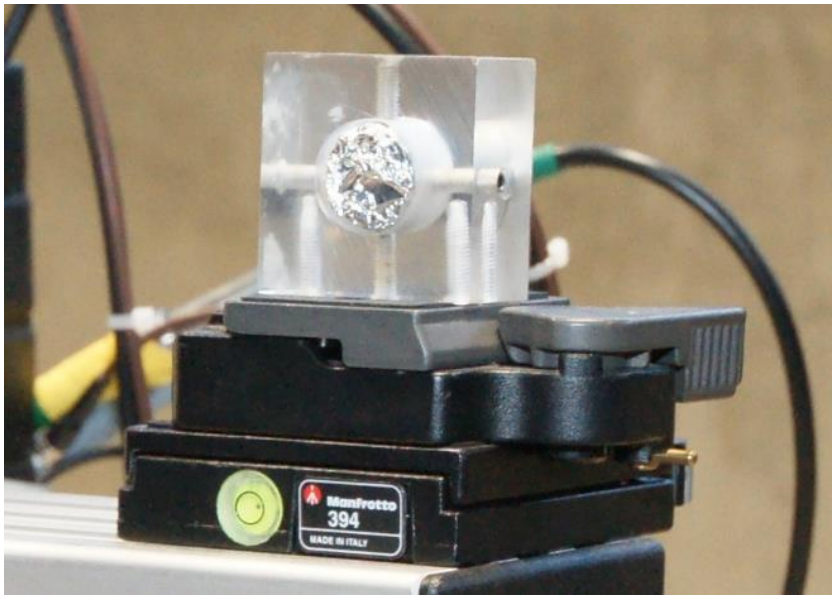
Build in 2000

- **PC17632**
- **User: Secondary / PSW: PSIbeam1**
- **Max load official 15kg, depends on the distance to the axis, Mechanical is up to 80kg possible with a distance <25cm possible. The dynamic torque of M_y 208Nm is relevant.**
- **Range X 500mm / Y 500mm / Z 500mm**



Pill

- **Hamamatsu R09880U-110 Photomultiplier**
- **Plexi glas body**
- **No stabile HV and Data connection.**



Pill

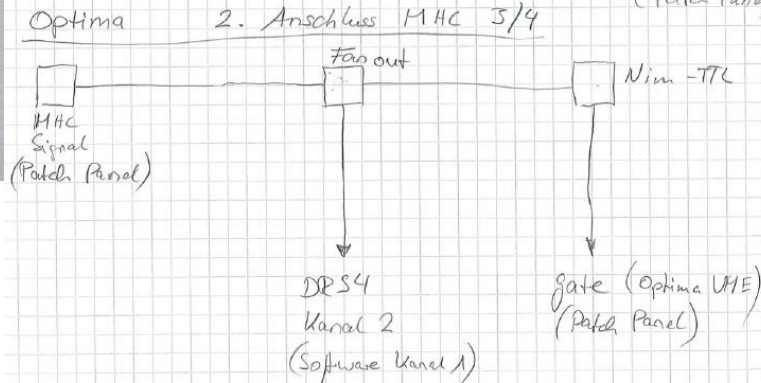
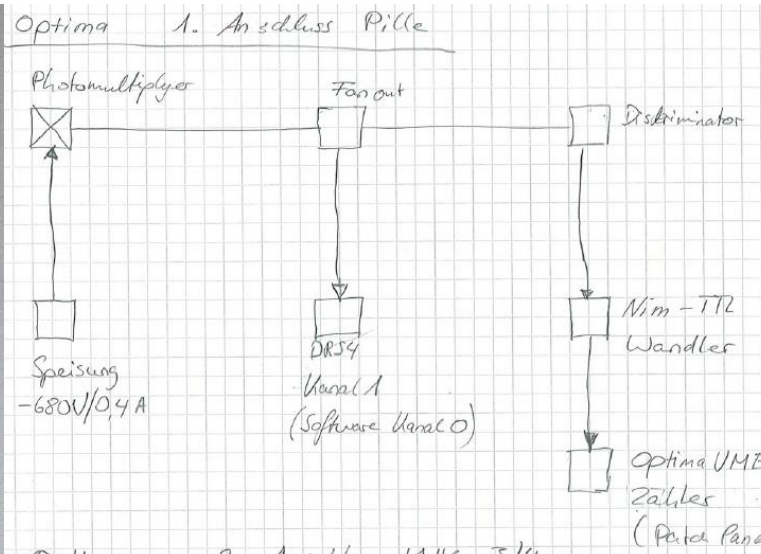
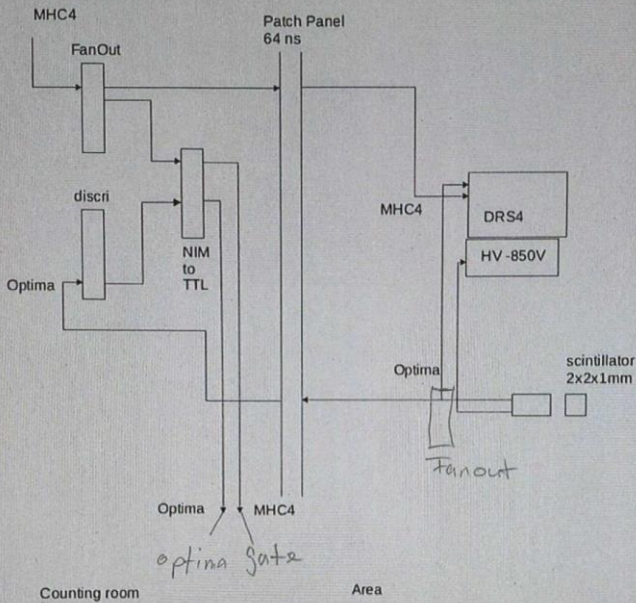
- **Hamamatsu R09880U-110
Photomultiplier**
- **All in one 3D printed box, sockets for
HV and Data implemented**
- **To make more of theme with different
Szyntilators is not a big thing.**



Optima

Short description in case you will use optima. We did like this successfully in 2025.... Toke us only 5-6h to find all documentation...

Signal flow for Optima and scanner



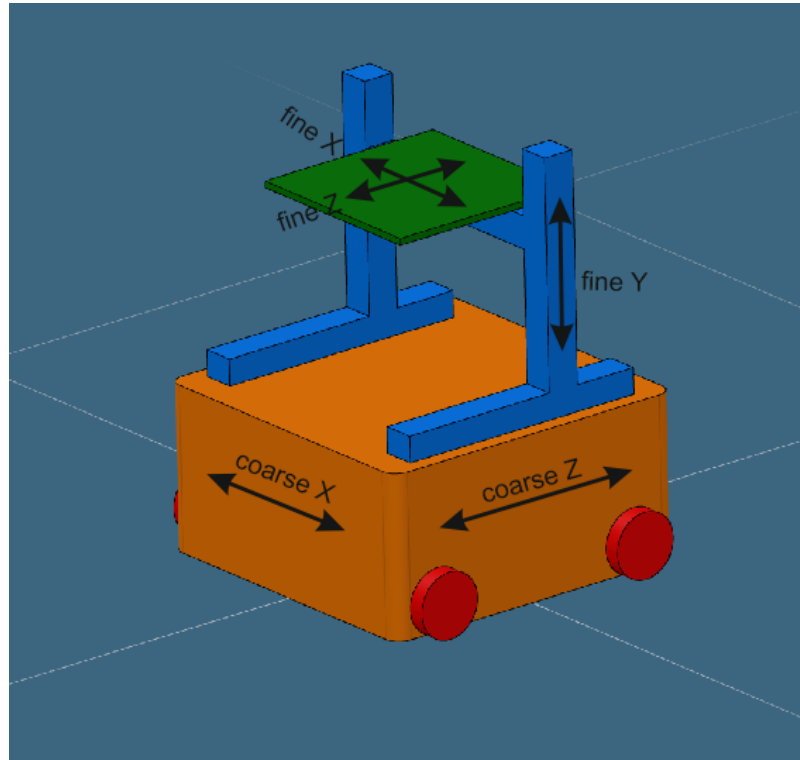
How to set up things:

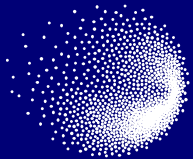
1. Connect the scanner to power and the Ethernet and start the control PC. The PC has an autologon) Connect remotely to the PC (user: secondary, pwd PSI beam1)
2. Start the Isel-scanner program and move the scintillator somehow to center of the beam axis.
3. When you start the program, you will be in an "absolute coordinate mode" (AC)
4. Install the scanner in the beam line, such that the scintillator is centered to the beam line (1.5m high). The alignment should ensure that the axes are somehow positioned in the middle of their range.
5. Start the HVset program and set a voltage in the range of 600 – 900 V, 1 kV is the maximum.
6. Start from the Windows start menu the DRS4 program and look to analogue signals, adjust voltage and threshold. Move the scanner in AC mode to the center of the beam spot.
7. Set the scanner to "relative coordinate mode" (RC). Close the DRS4 program.
8. Start the Profiler program. There is a parameter TAB to adjust the scanning range.
9. Start a scan. The scanner will first move along the x-axis and in a second step along the y-axis. A result of Gaussian fits will be presented, you can print end-or save the result. The total beam rates are calculated for a current of 2.2 mA beam current. You can now repeat the scan with offsets, if needed to get better results for the total rates.

We plan to implement Optima in the Hall signal distribution.

Studie project – Heavy load scanner

After BVR there are every year requests for an equipment support, with load 100-300kg and size in the order 500x500x500mm. Every second year with remote adjustment function.





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**Sometimes you win
– Sometimes you learn**

John C. Maxwell

**Many thanks to
Patrick Simon**