

DESY Test Beam Facility

https://particle-physics.desy.de/test_beams_at_desy/

Douglas Hasell, MIT, April 5, 2024



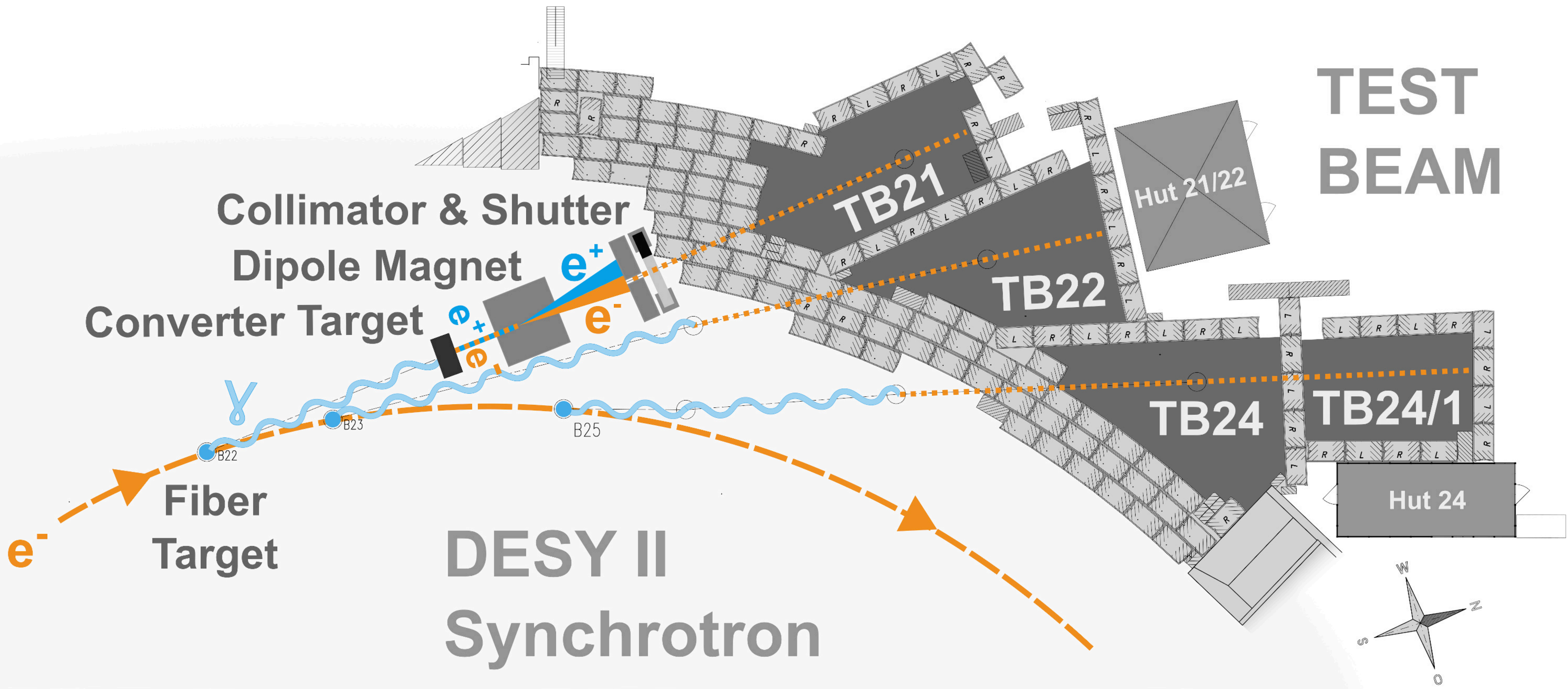
HERA



DESY Test Beam Facility

<https://doi.org/10.1016/j.nima.2018.11.133>

- Deutsches Elektronen-Synchrotron, DESY, in Hamburg, Germany
- 3 independent test beams, 4 areas: TB21, TB22, TB24, and TB24/1
- Beams produced by inserting a wire into the halo of the synchrotron beam
 - Runs parasitically with periodic synchrotron injection into PETRA
- Energies from 1.0 - 6.0 GeV selectable by setting a user controlled magnet
 - Rates of several kHz typical (15 kHz for 5 GeV when 6 GeV in DESY)
 - 1 typical run at beam energies of 2, 3, 4, and 5 GeV
- Runs 24/7 with occasional maintenance days



Collimator & Shutter
Dipole Magnet
Converter Target

e^-
Fiber Target

DESY II
Synchrotron

TEST
BEAM

TB21

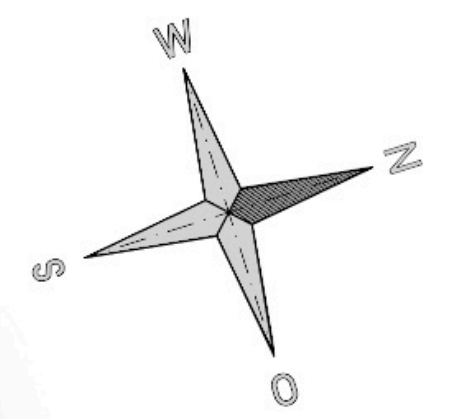
TB22

TB24

TB24/1

Hut 21/22

Hut 24



Hut 24

T24/1

T24

T22

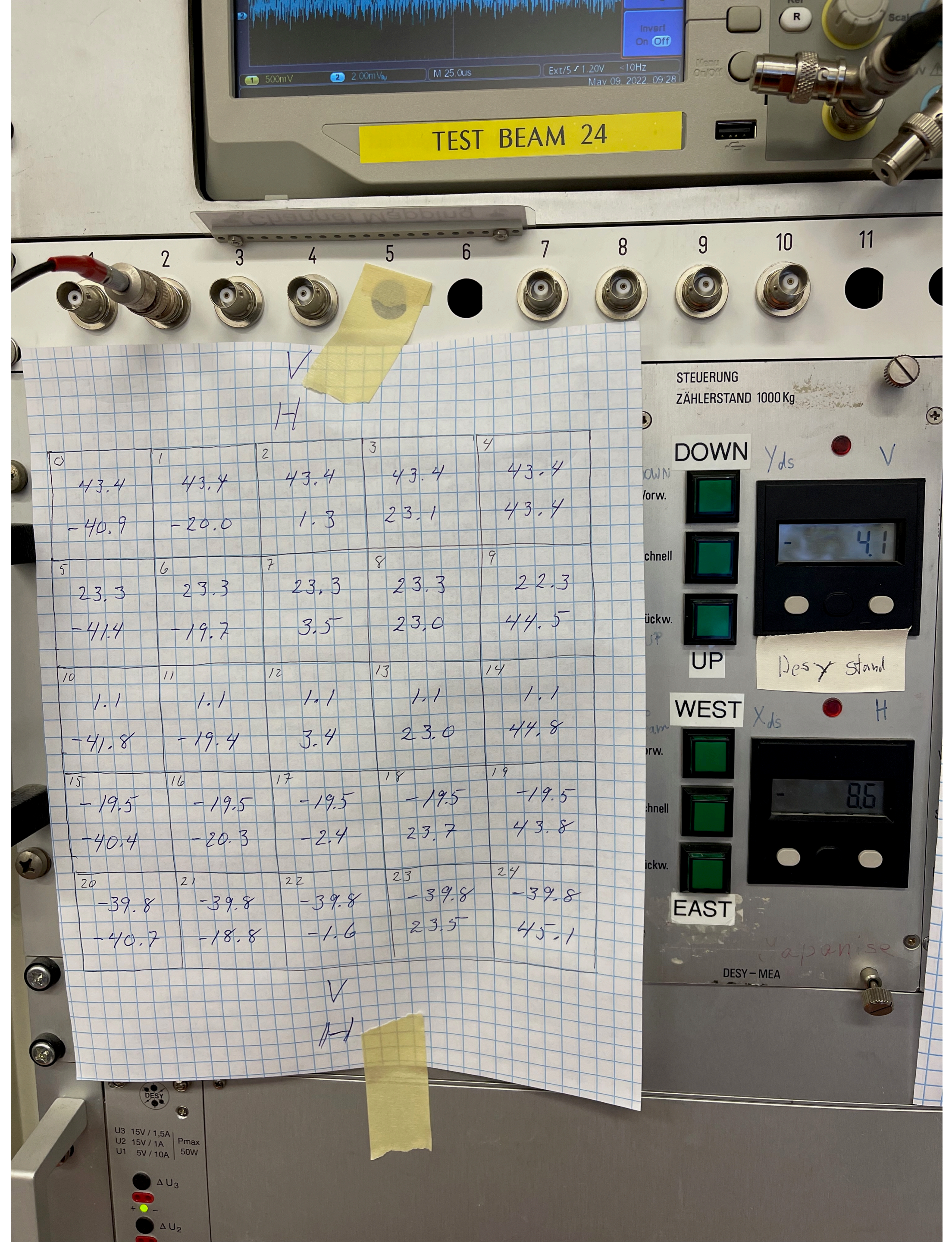
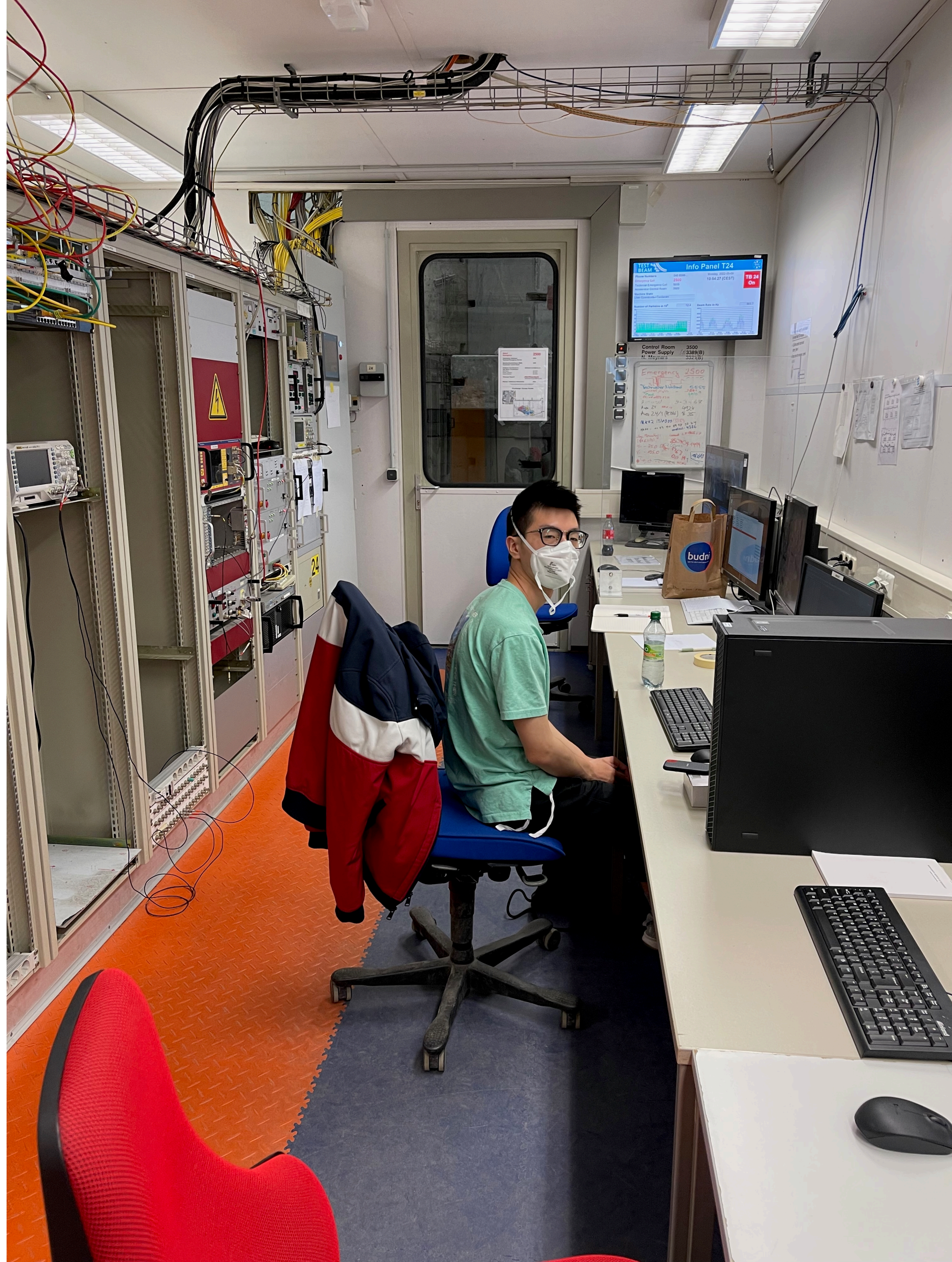
T21

Hut 21/22

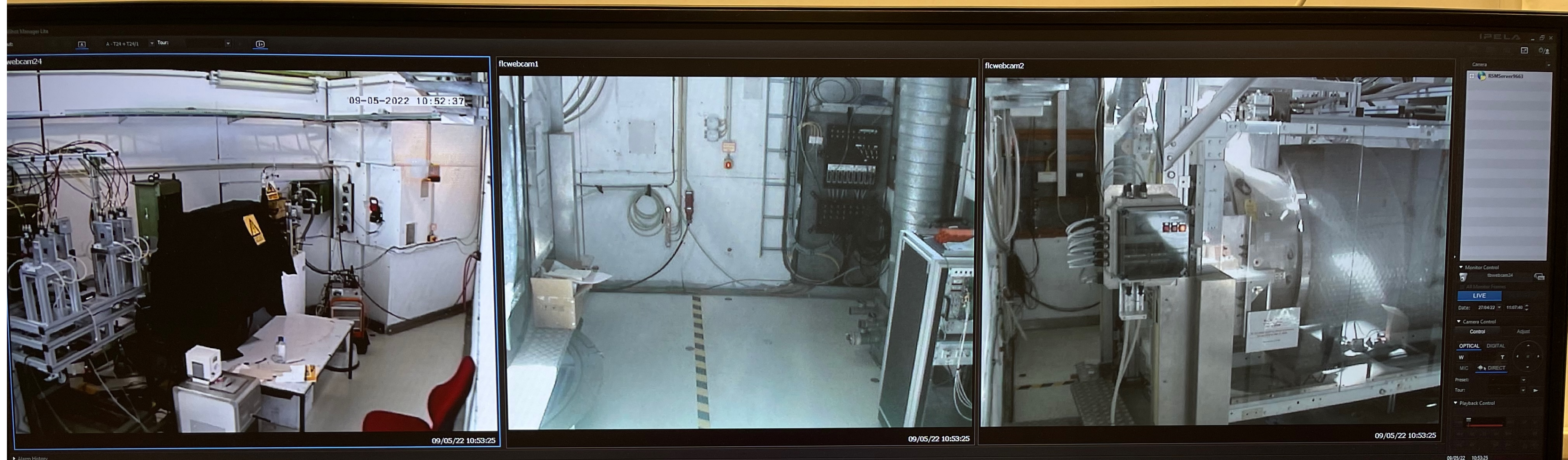
Hut 23



- **Test beam facility is extremely well organized and user friendly**
 - Users control the test area interlocks, beam stops, and beam energies
 - Translation tables, tracking detectors, trigger counters, various collimators, laser alignment system, plus HV, signal, and fibre optic patch panels to counting rooms in all areas; dipole magnets in TB21, solenoid in TB24/1
 - Bring what you need but some spare electronics, cables, PS, etc. available
- **Minimal bureaucracy**
 - Users must register online at least 1 week in advance of test beam slot
 - Users must attend in-person, safety lecture, Mondays, 13:00, in 1/310
 - DACHS card (photo ID), taken in 6/110, allows access to Hall II
 - Small number of “expert” users in each group allowed to set interlock



0.2 mT
1.3 mT

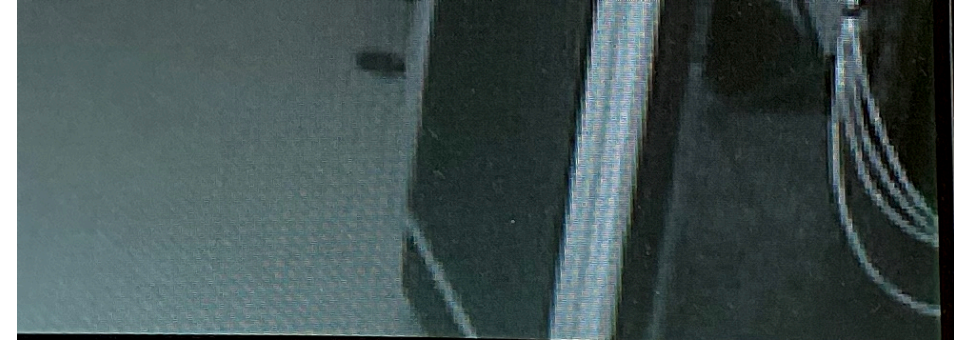


The bottom section of the monitor displays a software interface for magnet control and system monitoring. The interface is divided into several windows and panels:

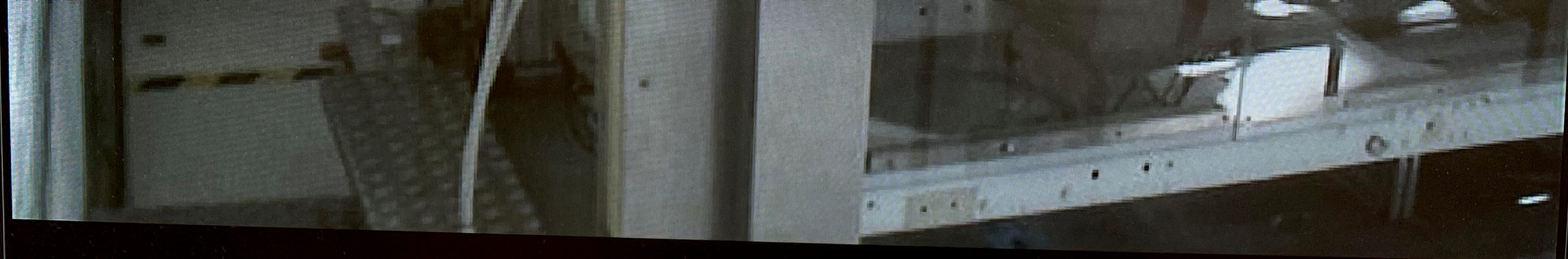
- System Overview:** A grid of buttons for different system components: Gas System, Motor Control, Magnet Control, HV Anode, HV Cathode, Subsystem, Detector, Beam Parameter, TPC DAQ, LCCD Server, and LPTC Electronic Logbook. A legend at the bottom indicates that green means 'ok', red means 'error', blue means 'under construction', and gray means 'not yet implemented'.
- Magnet Status:** A window showing 'Beam Energy [GeV]' set to 4.0 and 'Magnet Current(s) [A]' for Beam2401 (267.8...) and Beam2402 (149.7...). It includes a 'Select Beam Energy [GeV]' dropdown and 'Switch Magnet(s) on/off' buttons.
- PS Control:** A window titled 'TEST BEAM 24' showing a table of beam parameters.
- Beam Parameters Table:**

Kreis	PS	Status	Soil	tot Soil
0	Beam2401	En	267.6814	0.1602
0	Beam2402	En	149.7978	-0.0229
- System Status:** A window showing 'T21 OFF', 'T22 OFF', and 'T24 ON' with a corresponding bar chart.
- Taskbar:** Shows the system clock as 'Mon 10:53' and the system name 'BKR10D2CONMEA03'.

login: tbuser password: camTBusr



09/05/22 10:53:42



09/05/22 10:53:42

OPTICAL DIGITAL

W T

MIC DIRECT

Preset:

Tour:

▼ Playback Control

09/05/22 10:53:42

TestBeam24 Magnet Control (Version 1.2.0 (23.02.2021))

Datei Optionen Hilfe

Beam Energy [GeV]

4.0

Magnet Current(s) [A]

Beam2401: 267.8...
Beam2402: 149.7...

Select Beam Energy [GeV]

4.0

Magnet Status

Beam2401:	Soll Pol. Positive	Soll Ein
Beam2402:	Soll Pol. Positive	Soll Ein

PS Control

Datei Optionen Hilfe Ansicht Expert

TEST BEAM 24 Bedienungspanel

Kreis	PS	Status	Soll	Ist-Soll
0	Beam2401	Ein	267.6814	0.1602
0	Beam2402	Ein	149.7978	-0.0229

bkr10d2conmea03 | 09.05.22 10:53:42 | Operations Mode [Betrieb] | Serveranwahl [Default] | (3)KeinIniDatei

MCA Controls

BKR10D2CONMEA03

RUN

Test BEAM 24 Magnets

Test beam magnet control

BKR10D2CONMEA03

RUN

PS Control Test BEAM 24

Test Beam Version of Generic Magnet PS Control App

Host Control

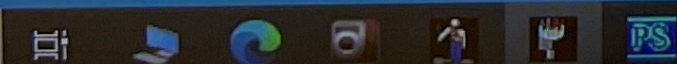
Application Group Control

Cleanup

WARNING: configuration changed in central repository: 08.03.2021, 18:06:00.Consider to reload.

BKR10D2CONMEA03

Type here to search



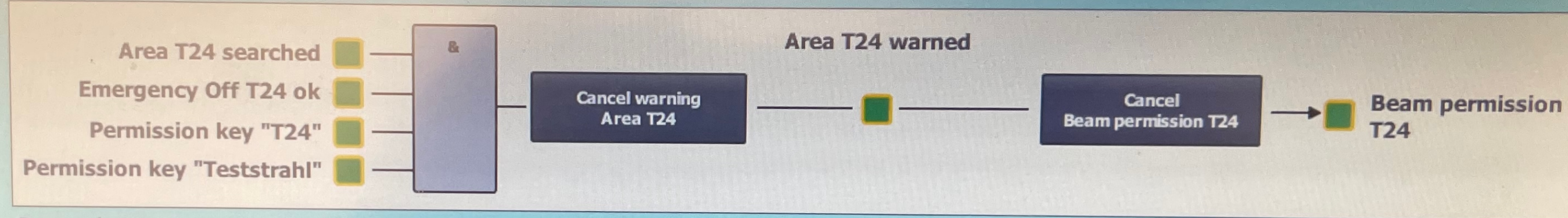
MCA Controls 10:53 AM 5/9/2022



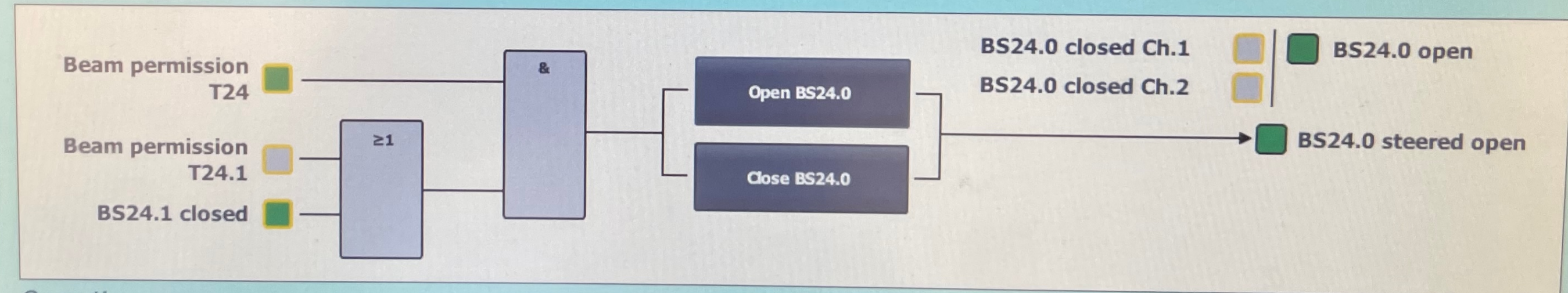
Logicview + Operation: Testbeam T24

09.05.2022 10:54:22 SPS

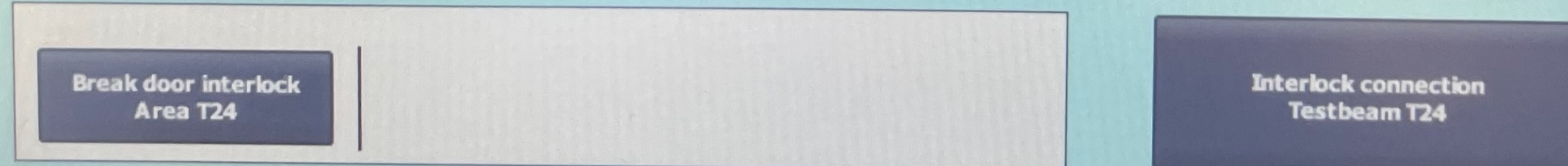
Beam permission



Beamshutteroperation



Operations



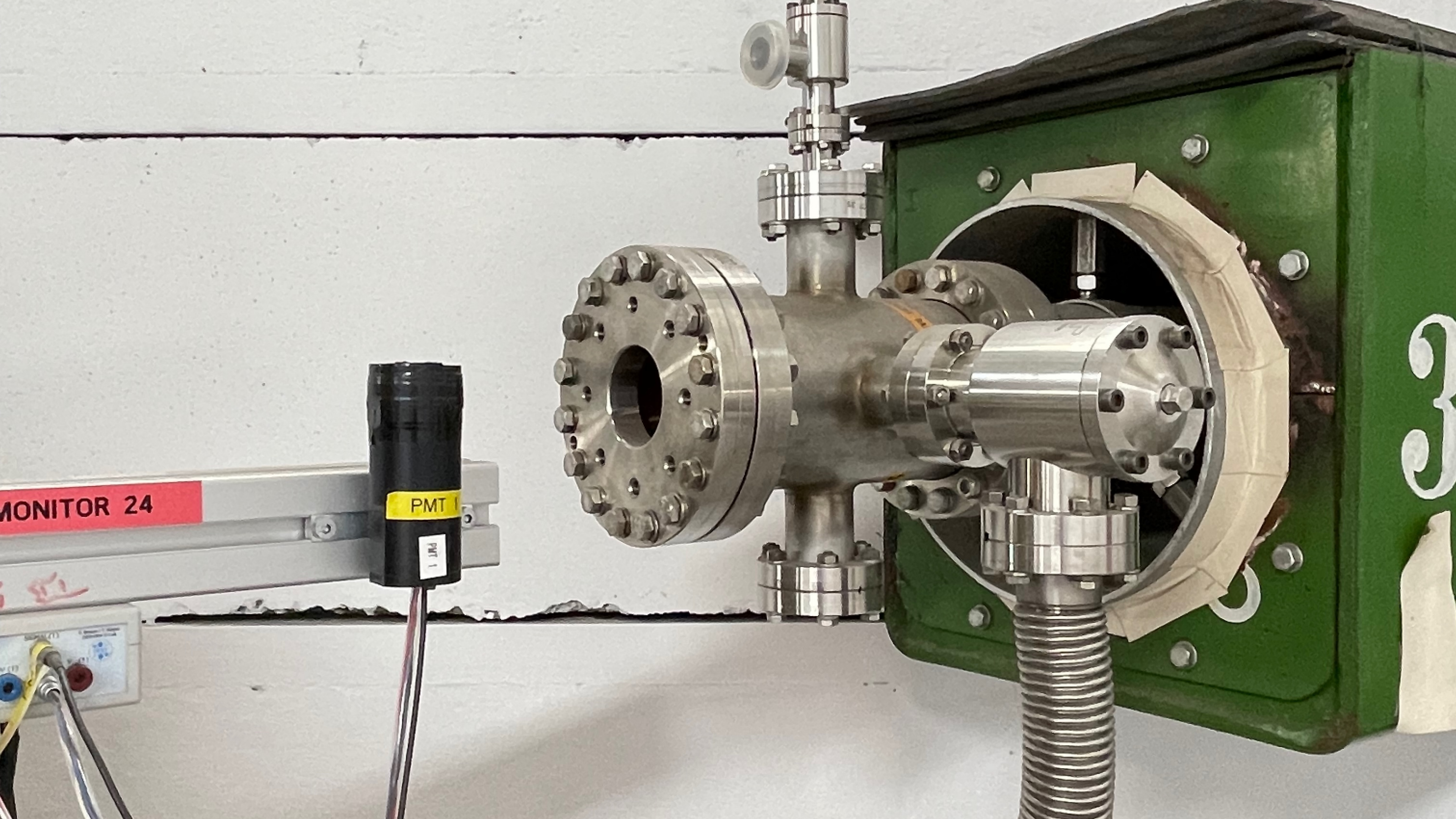
- Home
- Area Search T24
- Logic + Operation T24
- Emergency Off T24
- Experts T24
- Messages

- F1
- F2
- F3
- F4
- F5
- F6
- F7
- F8
- F9
- F10

MONITOR 24

PMT

PMT 1





TEST BEAM MONITOR 24

PMT 2

PMT 1

42 51

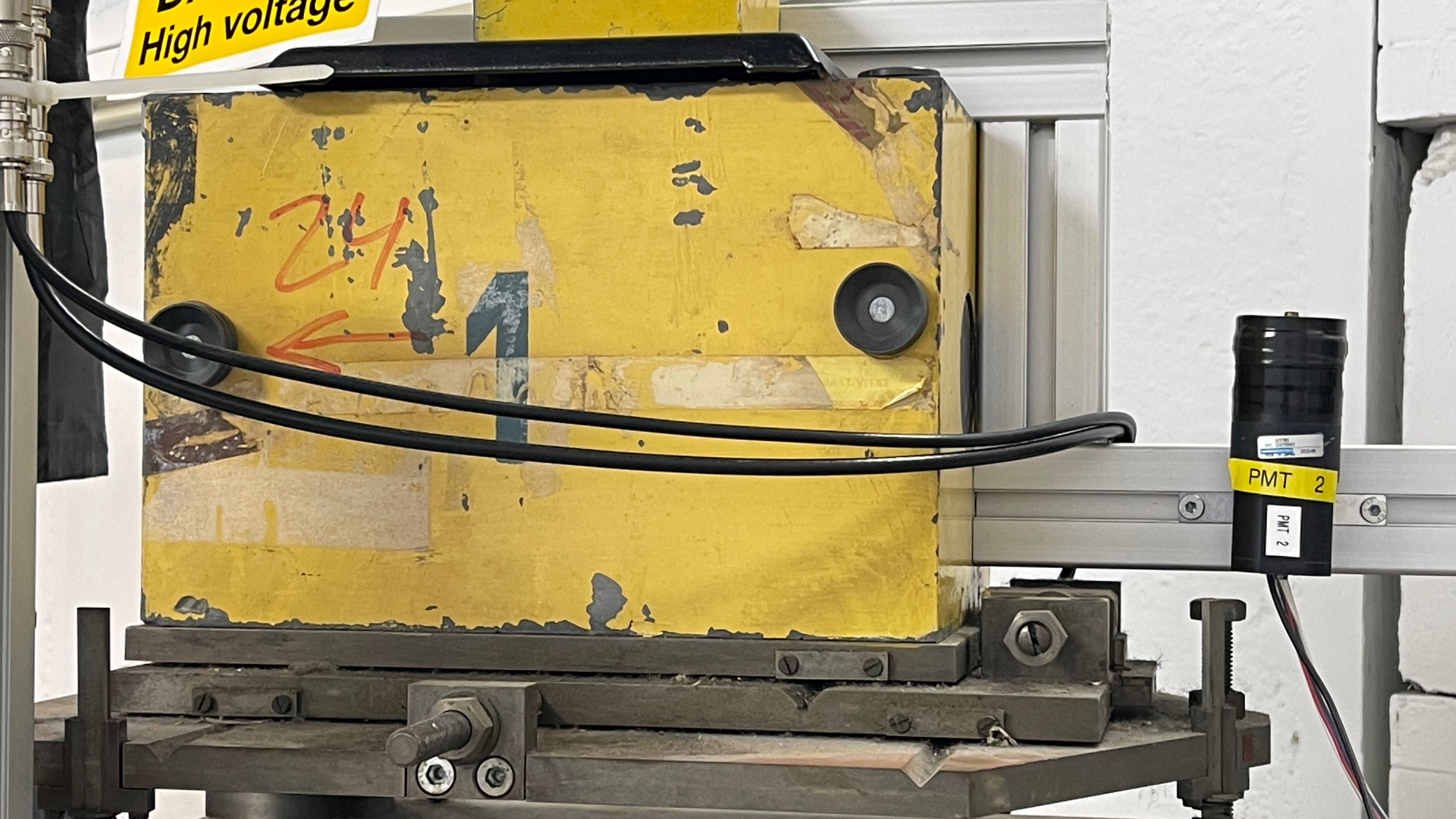


High voltage

24
← 1

PMT 2

PMT 2



Strahl

⚠️ VORGEHT



Toi
12
V



DANGER
High voltage

TEST BEAM MONITOR 24

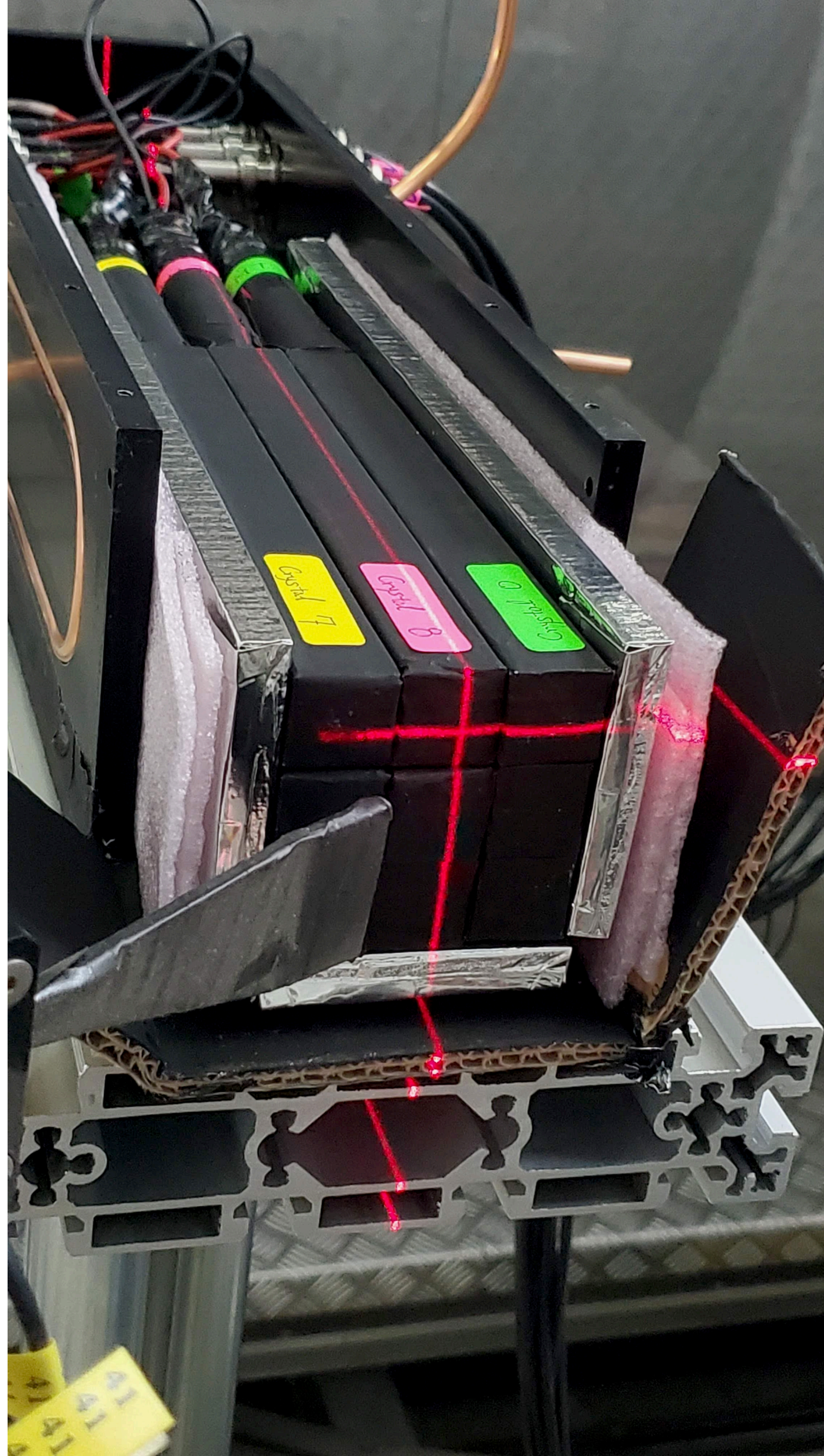
PMT

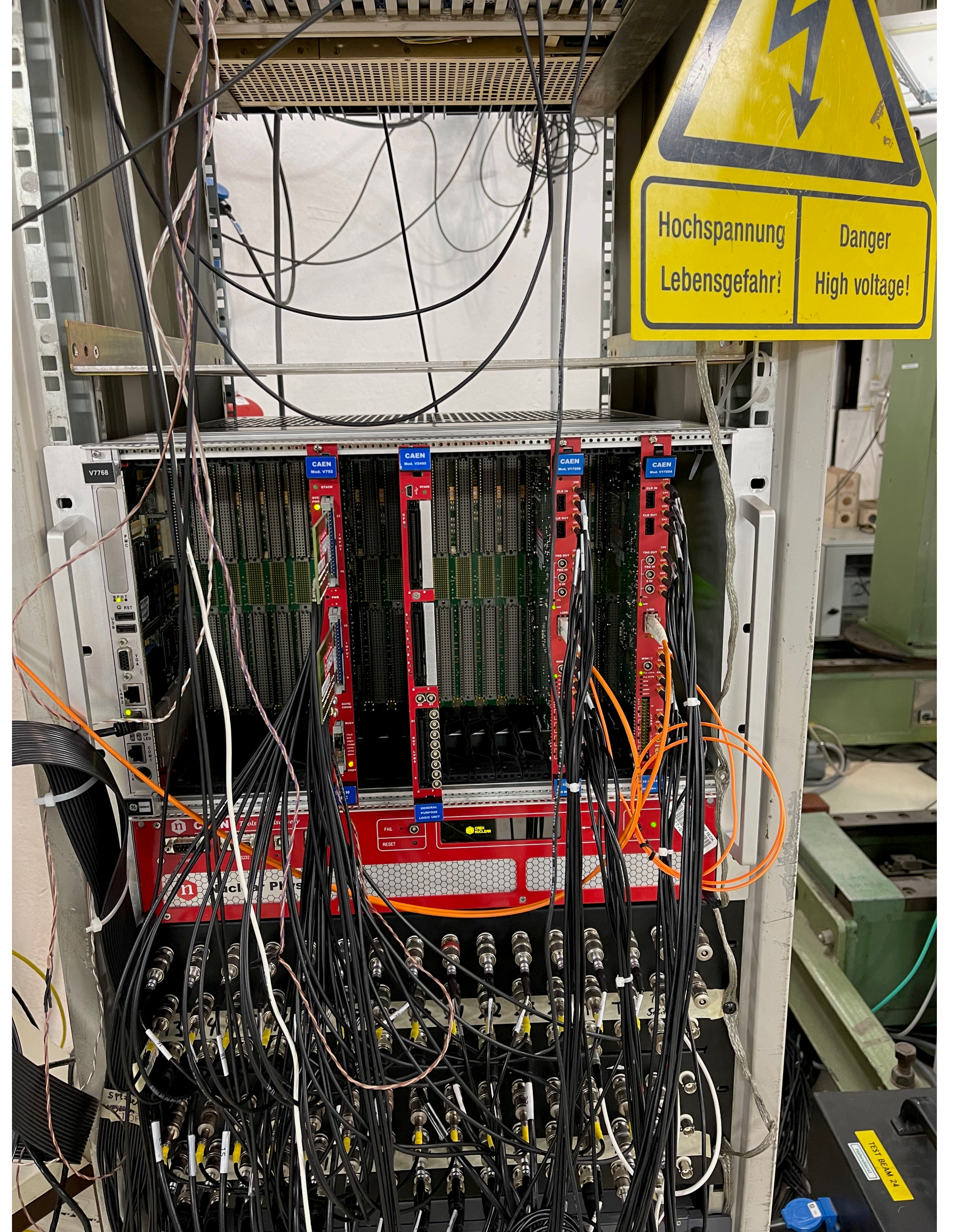
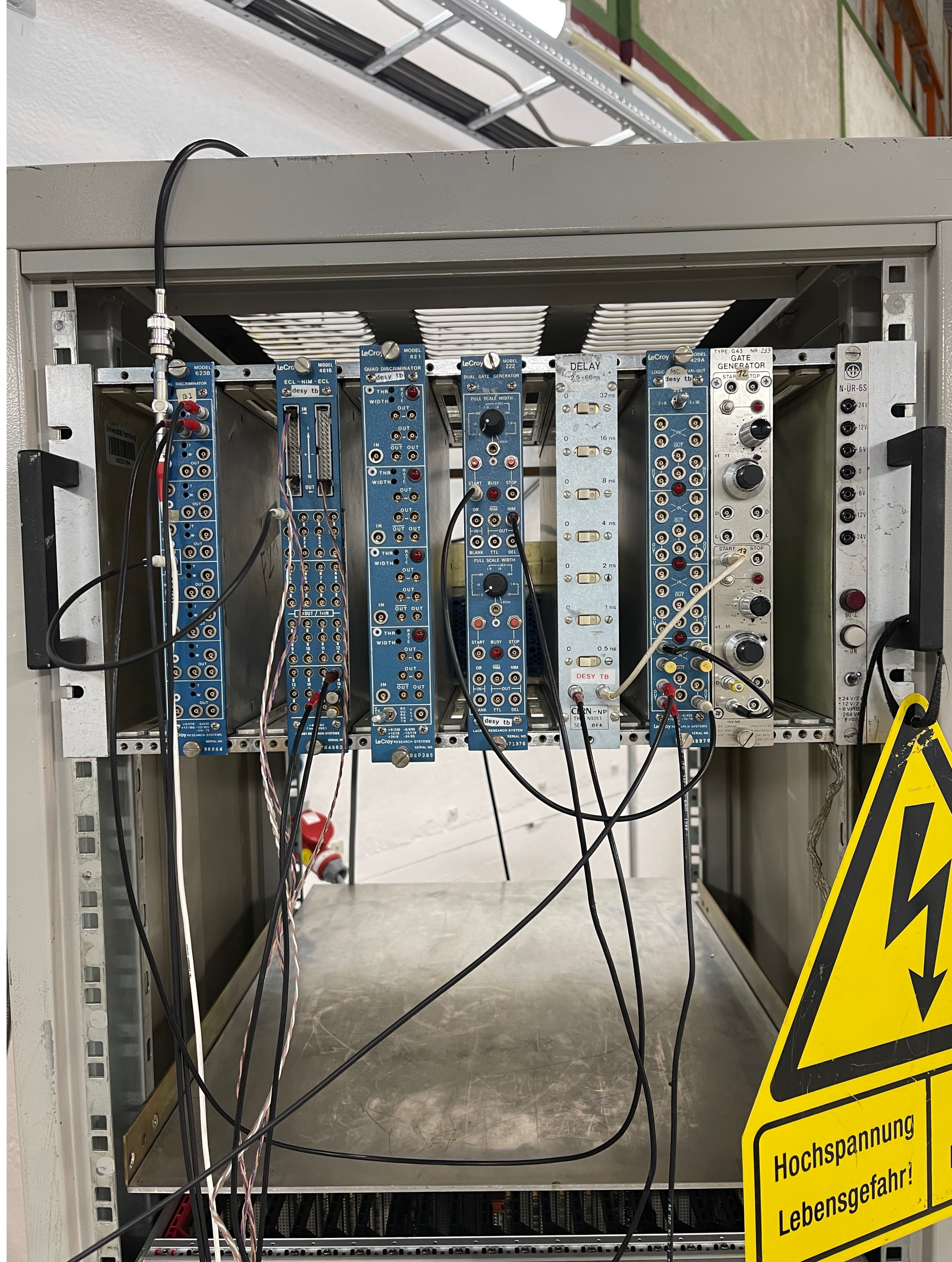
PMT

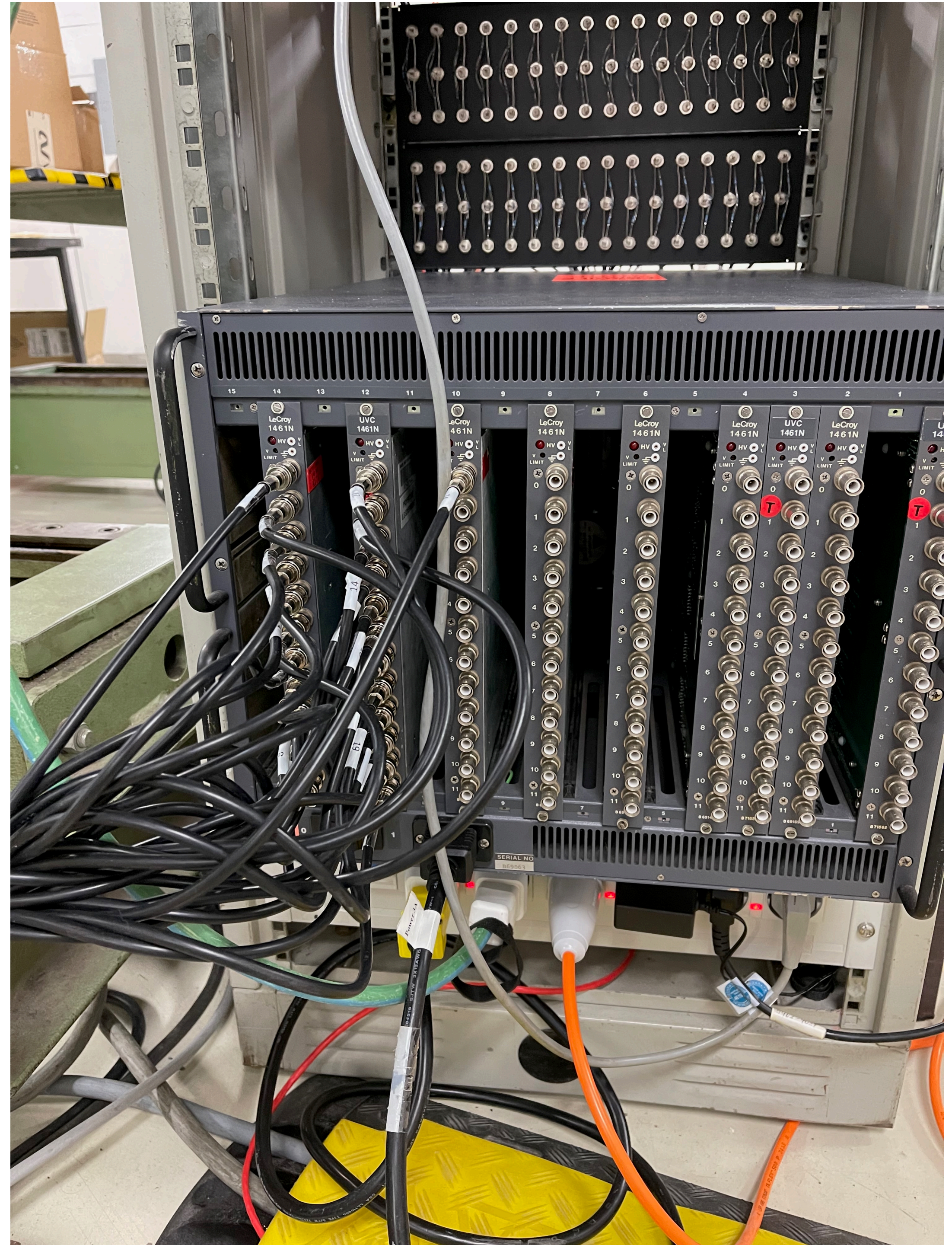
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DIGITAL THERMOMETER















HERA

- **DESY hostel**
 - https://welcome-services.desy.de/hostel_in_hamburg/index_eng.html
 - 35 euro single room with shower, 44.5 euro double room with shower
 - Communal kitchen, plates, cutlery, fridge, stove, dish washer, laundry
 - When you request hostel room the name of DESY group is: FH-Test Beam
- **Shipping equipment to the DESY Test Beam Facility**
 - Should arrive at least 1 week before test beam slot
 - Proper customs, export/import documentation

Your Name (Your Experiment Test Beam)
c/o Marcel Stanitzki/Ralf Diener/Norbert Meyners
Geb. 27 - Halle 2 Nordtor
DESY Notkestr. 85
22607 Hamburg, Germany

- **Services**

- two cafeterias for lunch
- coffee shop open 07:00 - 18:00, also serves dinner
- wireless throughout DESY site, EDUROAM
- post office and DHL package station on site
- lots of restaurants, grocery stores, shops, etc. nearby
- bus and subway nearby and very convenient and easy to use

- **Test Beam Schedule**

https://ias.desy.de/pls/apex/f?p=699:440:::NO::PSELECT_YEAR:2024