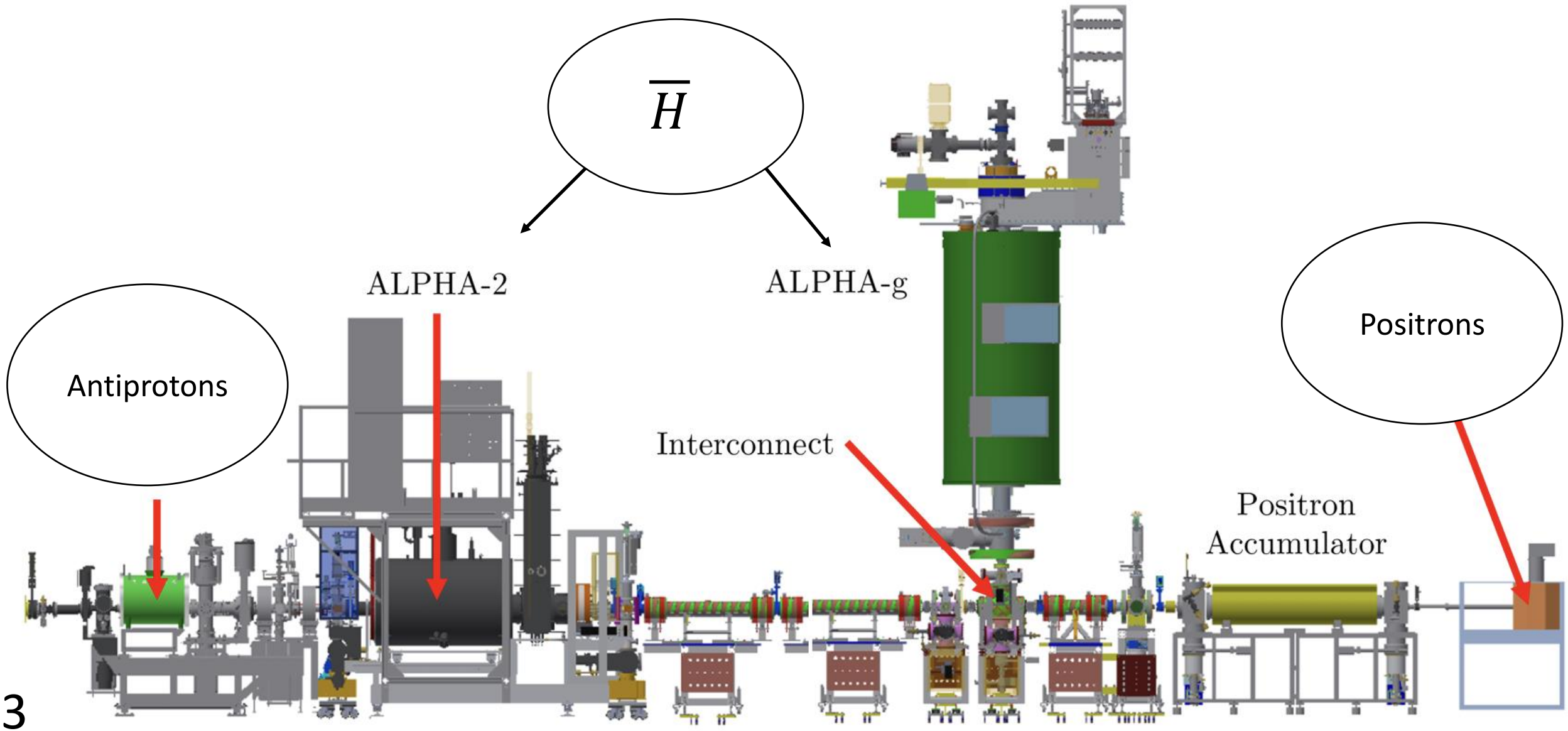
Magnet control system in ALPHA-g

Veronika Batianova
V.N. Karazin Kharkiv National University
06/05/2024
Supervisor: Dr. William Alan Bertsche

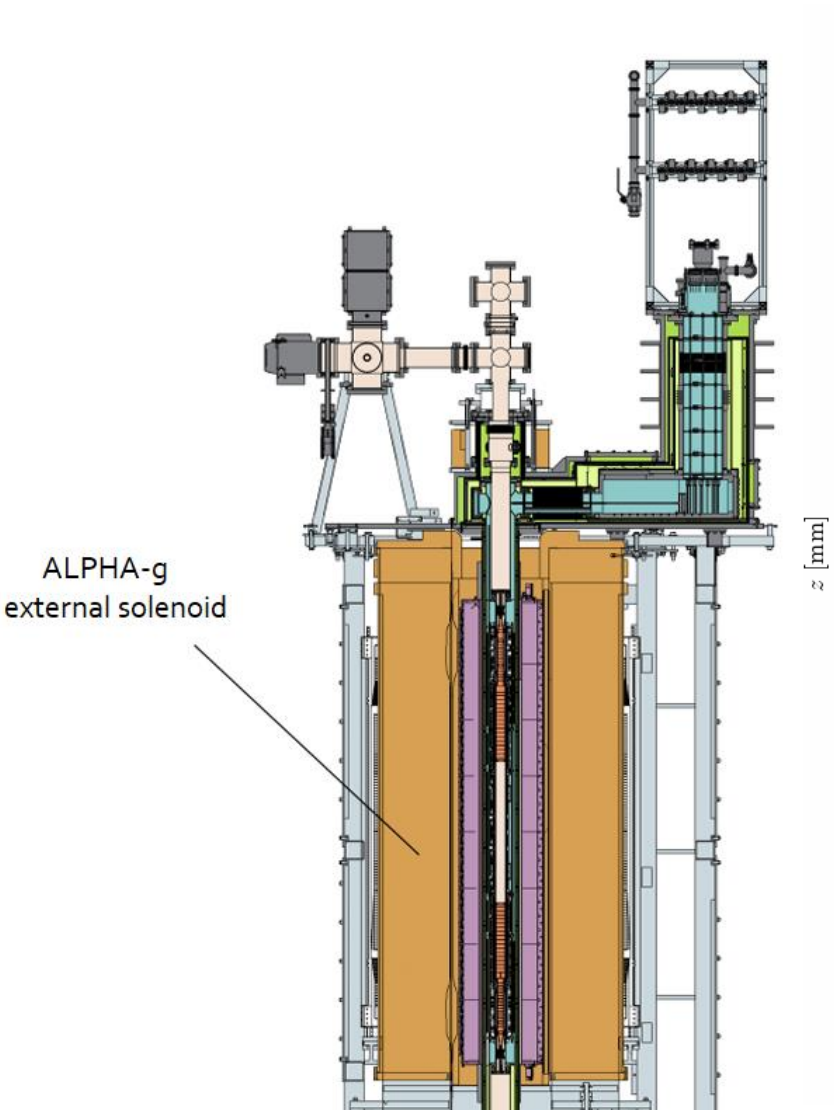
Agenda:

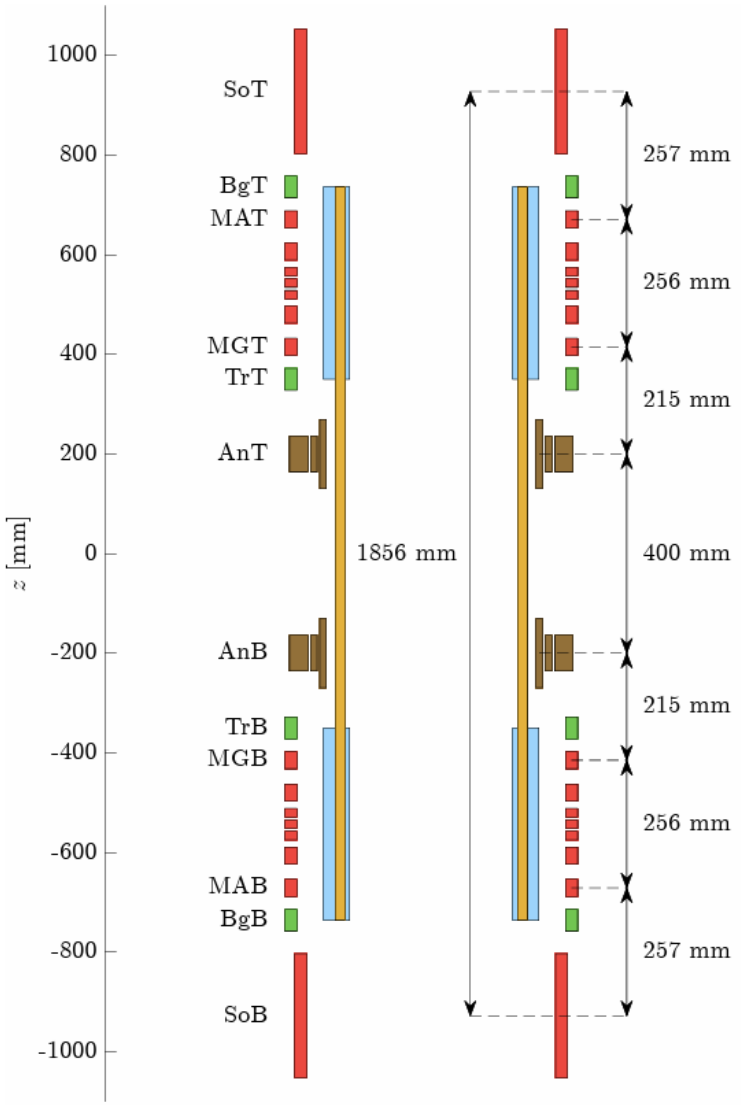
- The ALPHA apparatus
- The ALPHA-g magnet system
- Power supply control system

The ALPHA apparatus

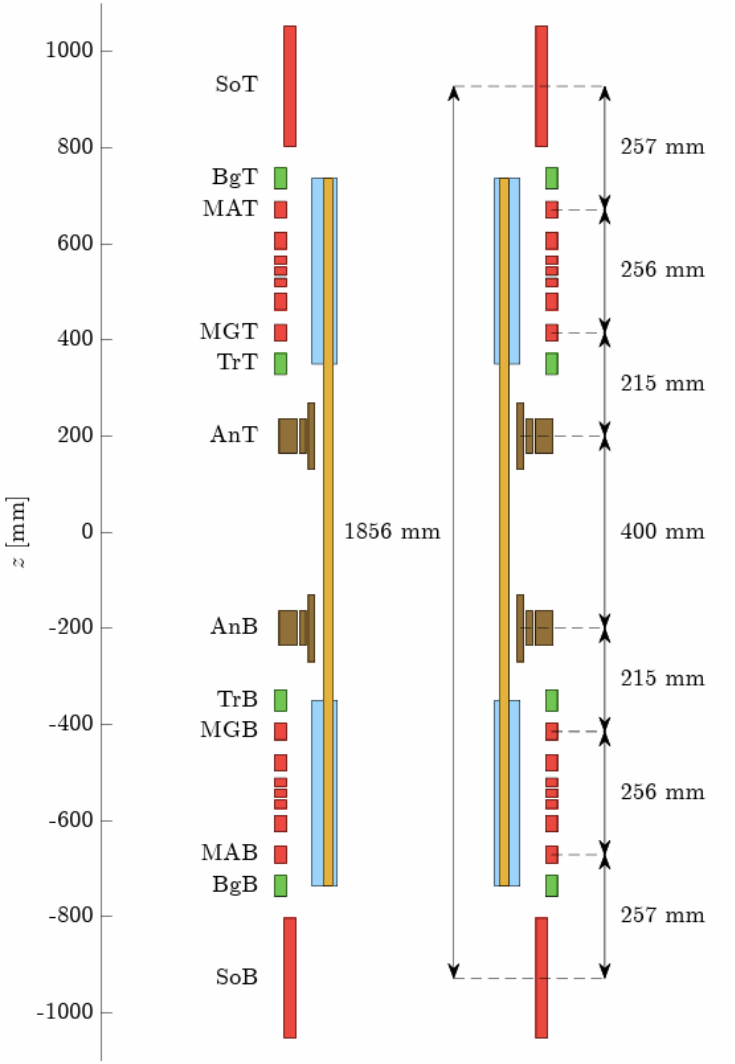


ALPHA-g magnets





Power supplies



Magnets

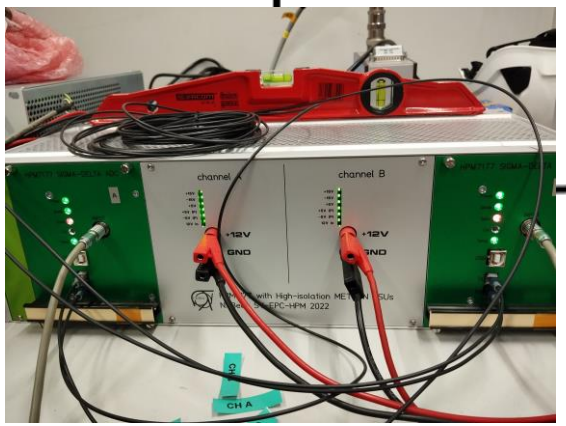
Power supplies

The general scheme

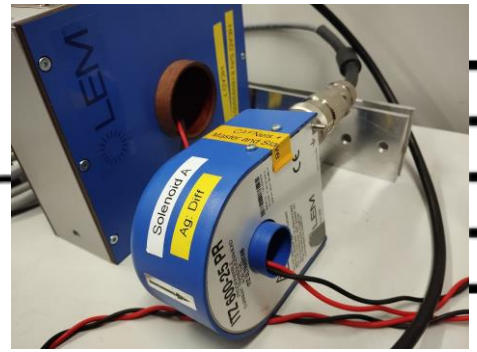
FPGA

Arduino

PS



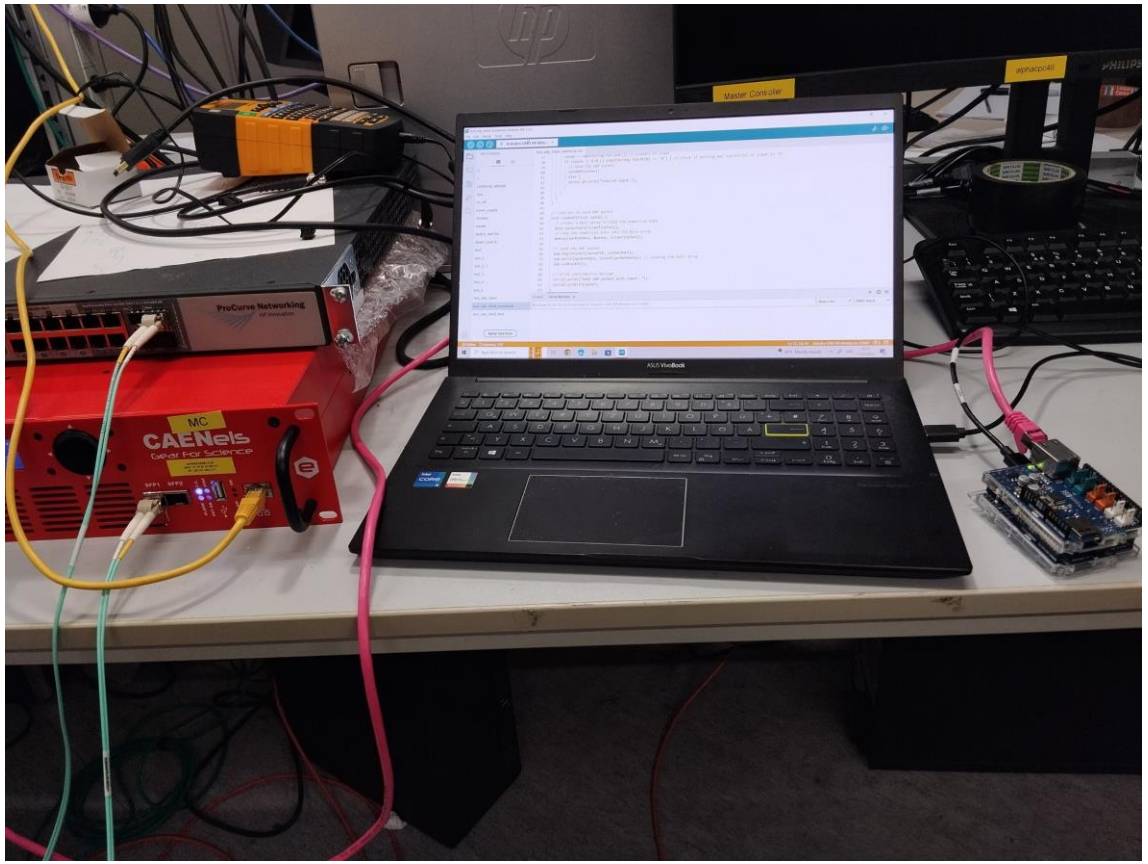
ADC

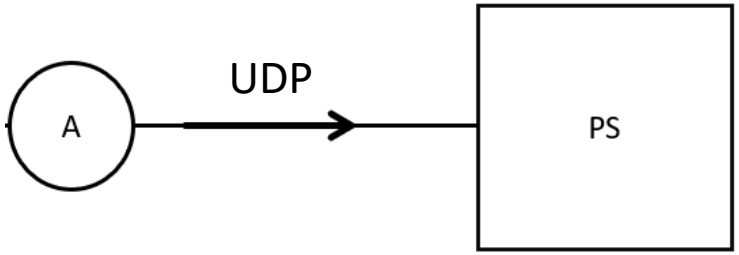


DCCT

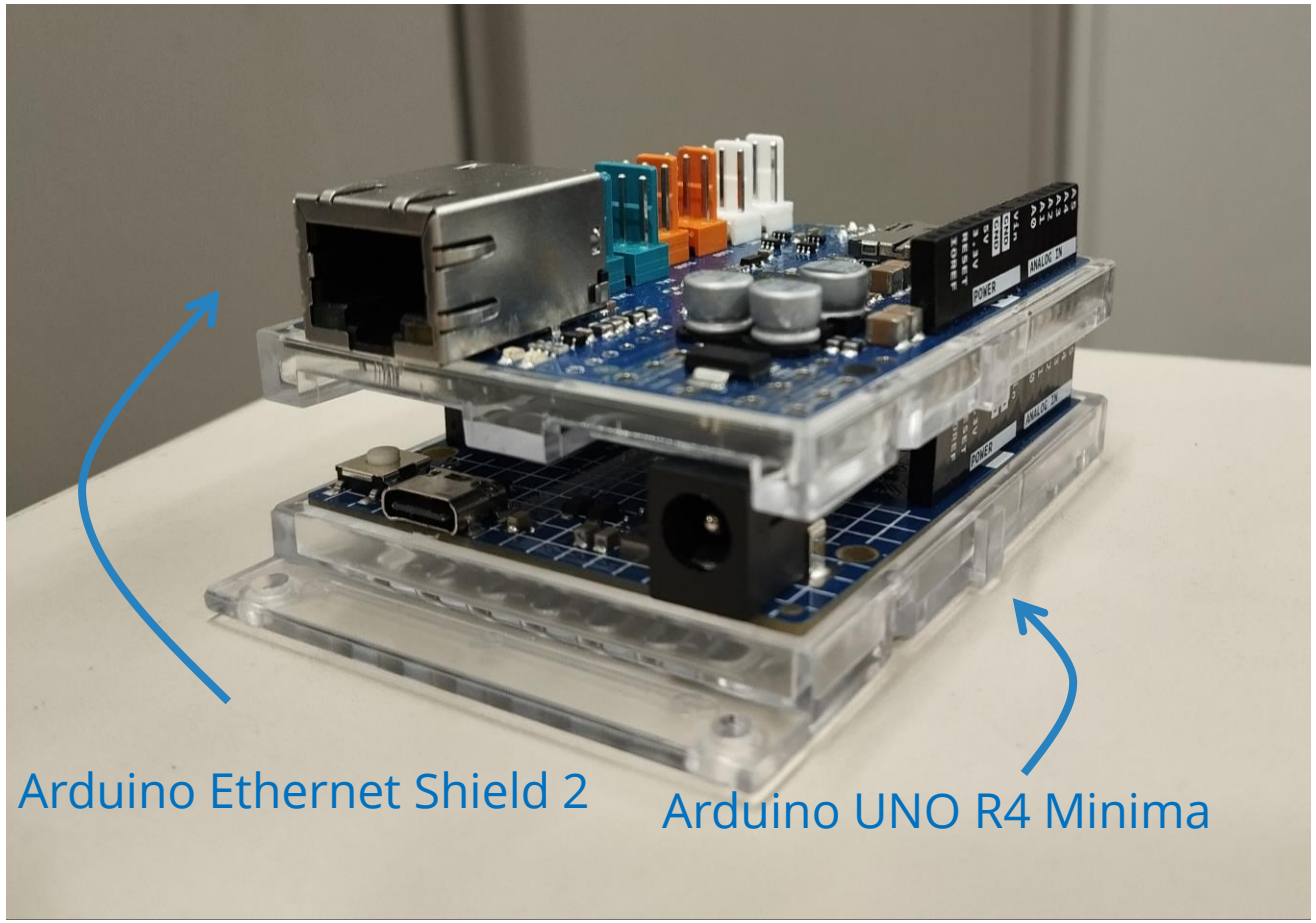
Magnet

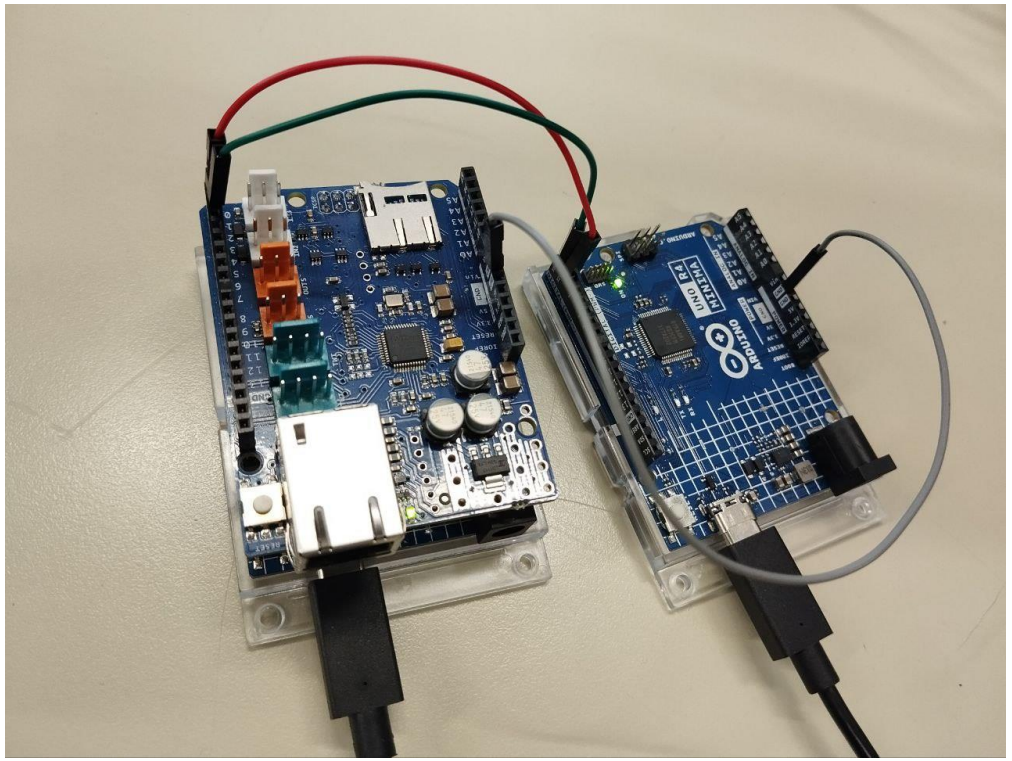
Arduino – PS communication





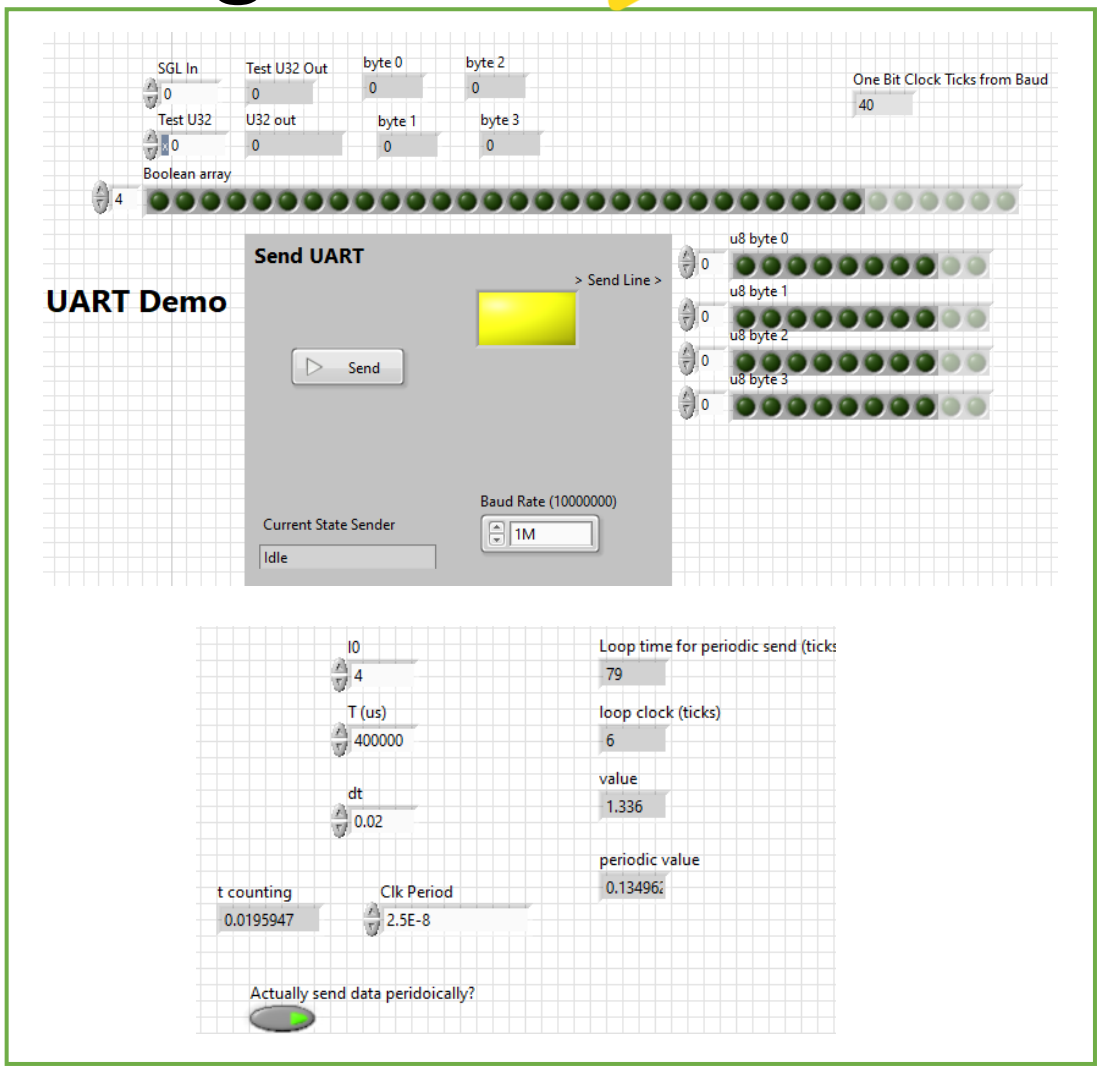
Working with the Arduino



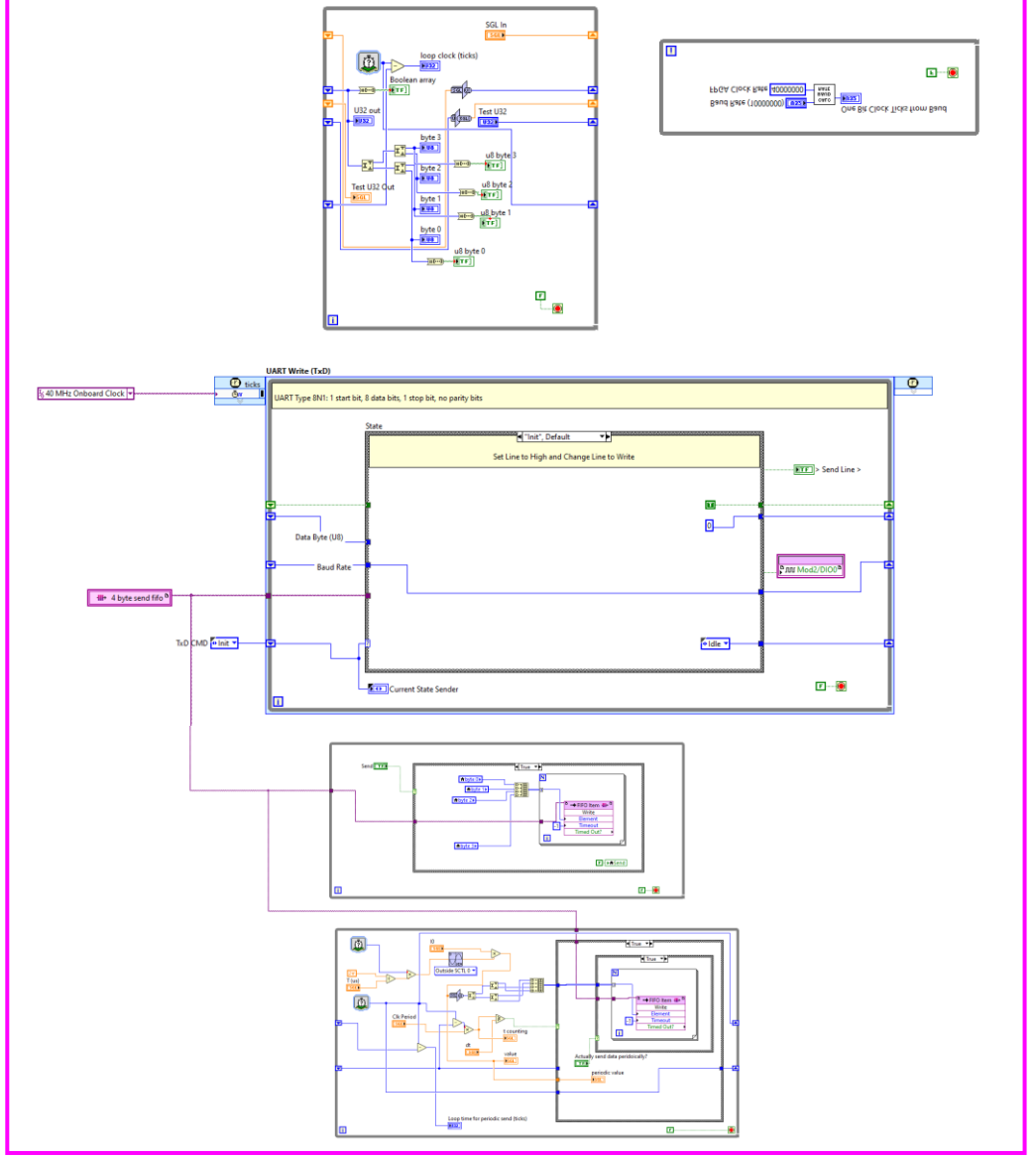


Arduino – Arduino communication

Working in the LabVIEW™



Interface

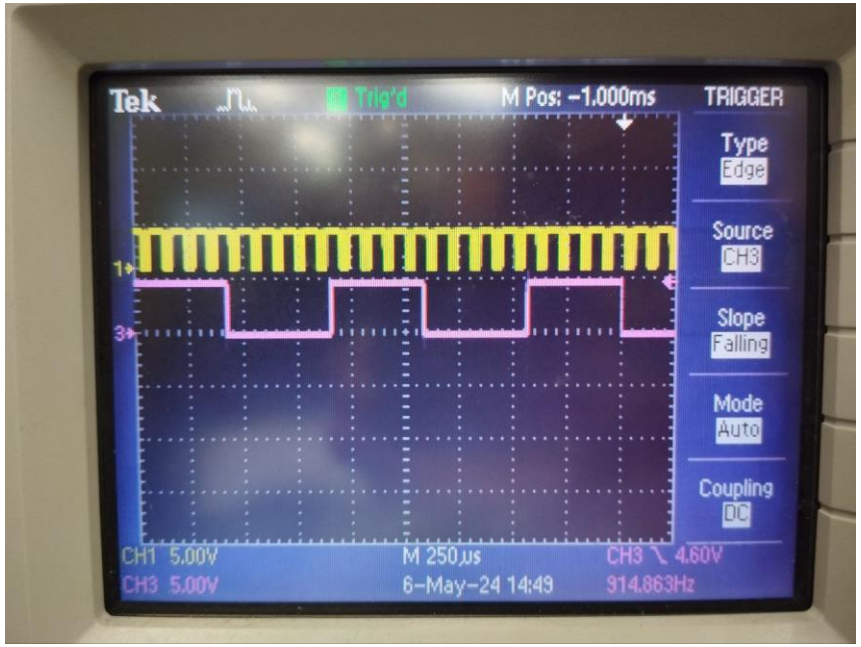


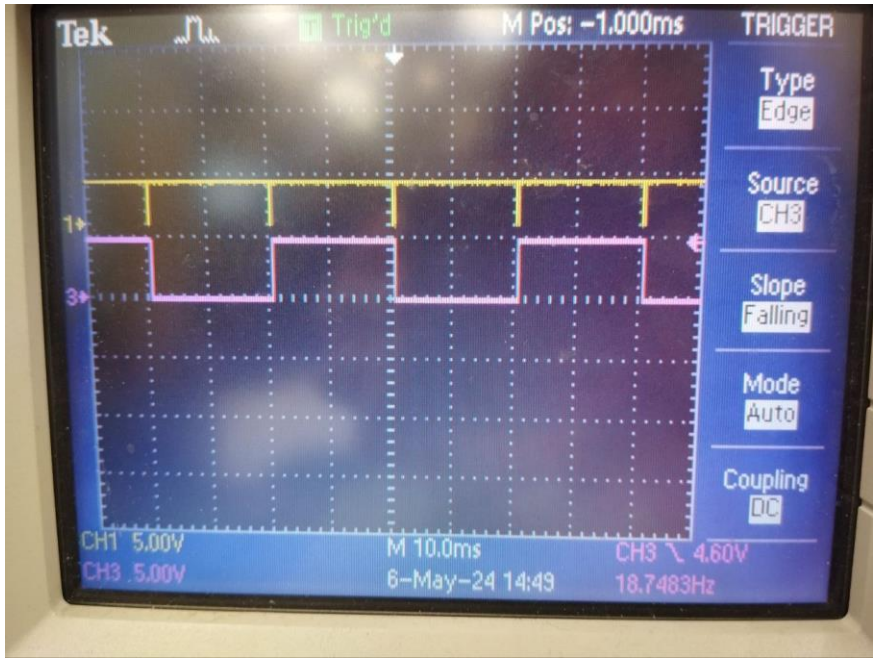
Actual code

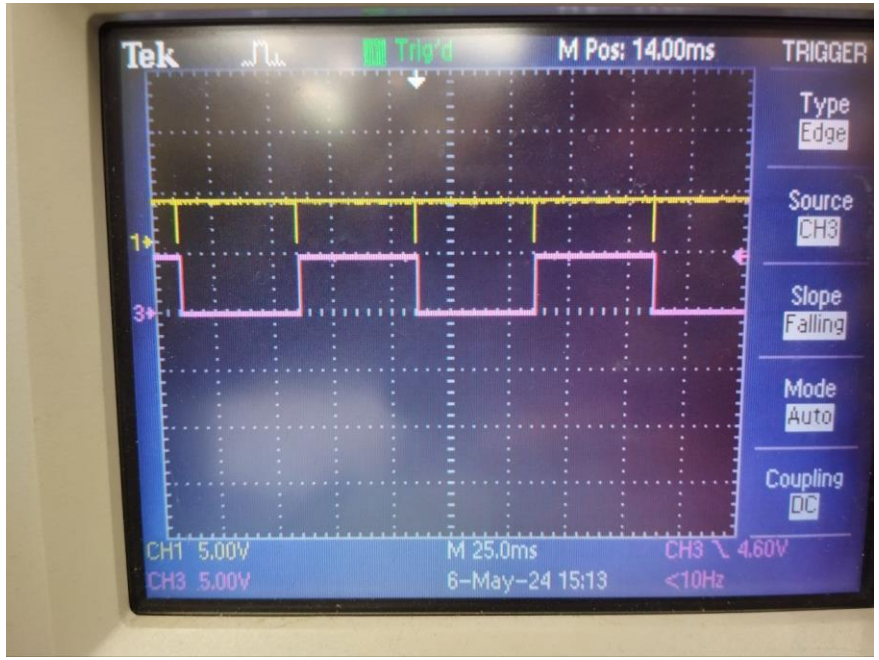
Actual signals

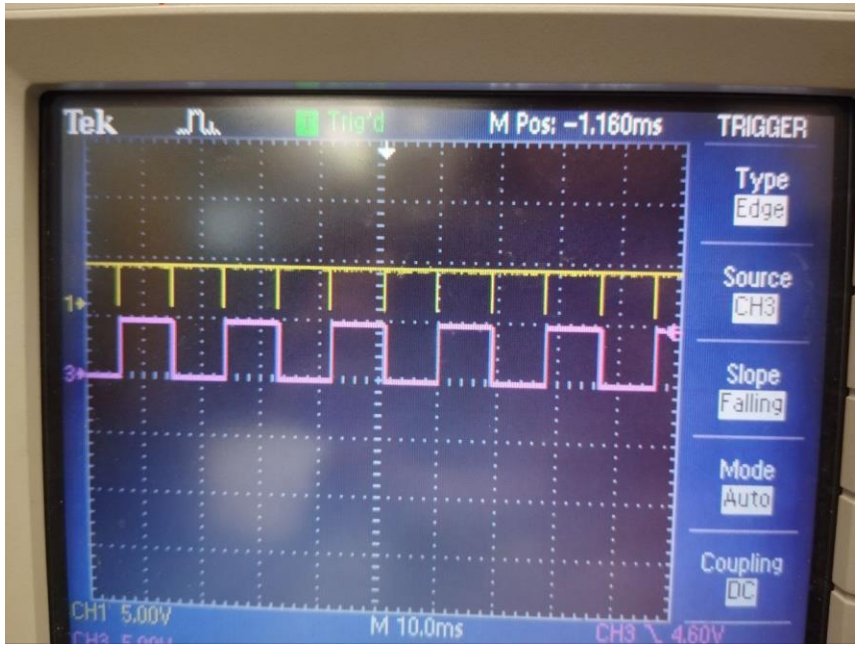
- FPGA

- Arduino

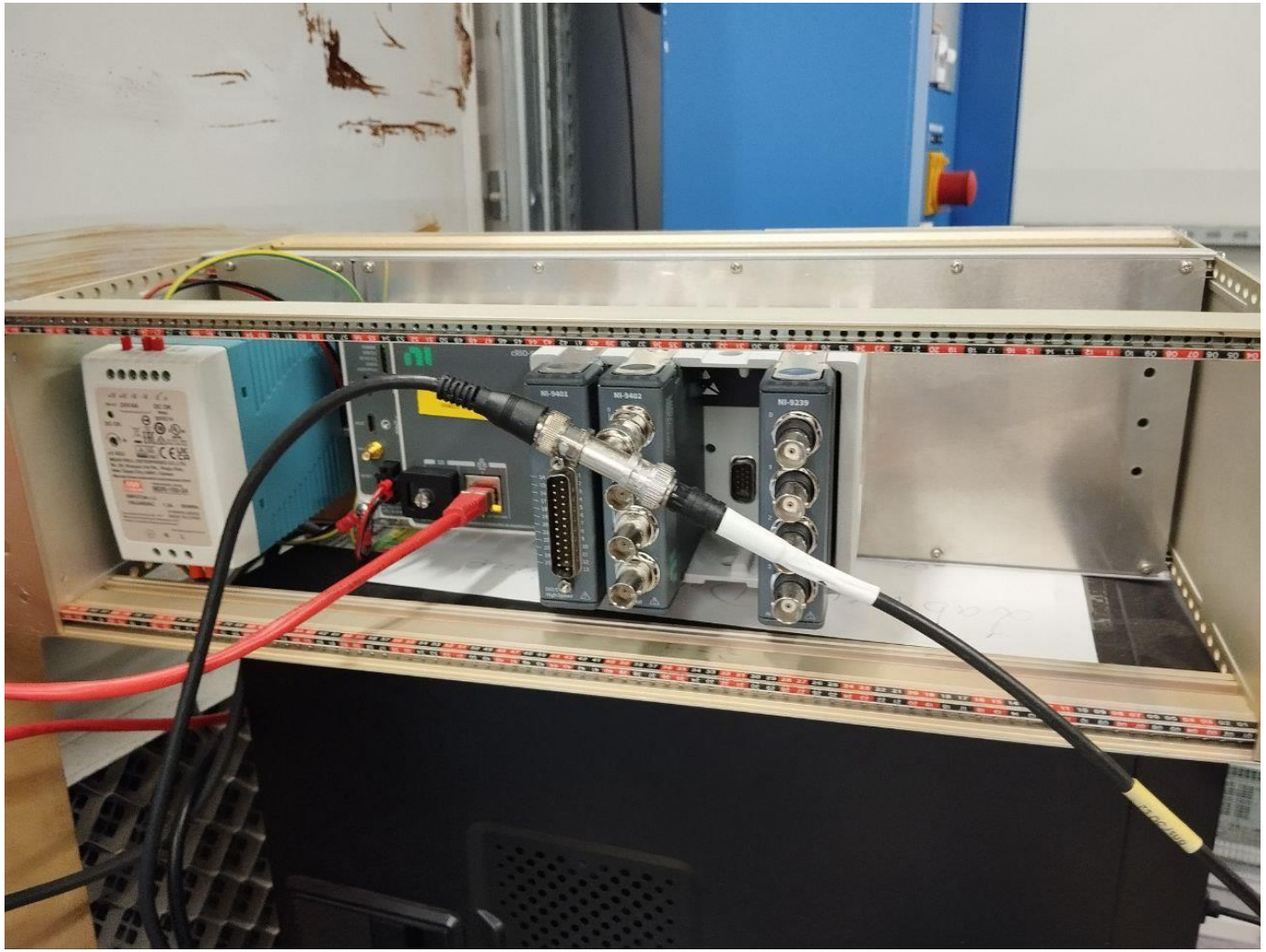


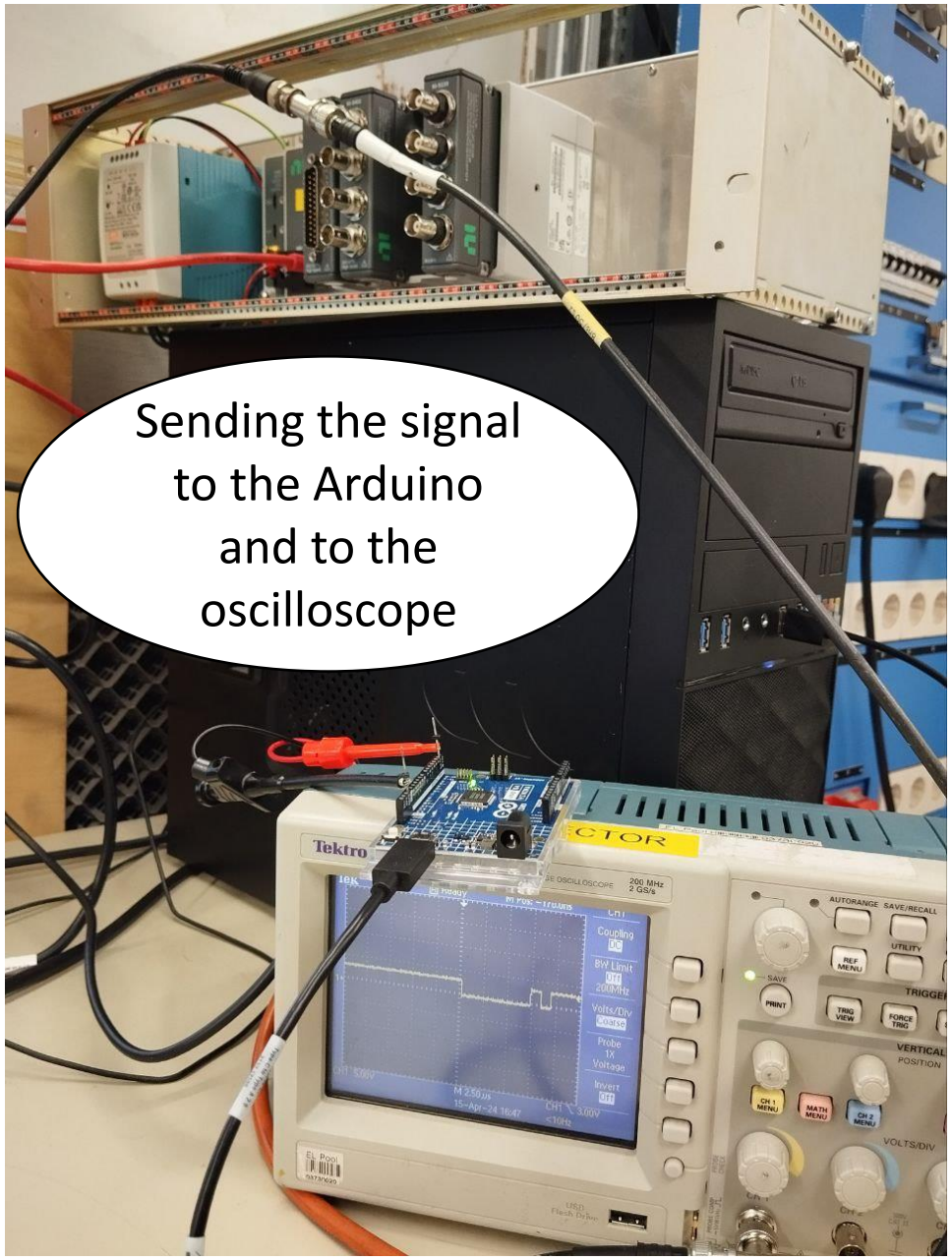






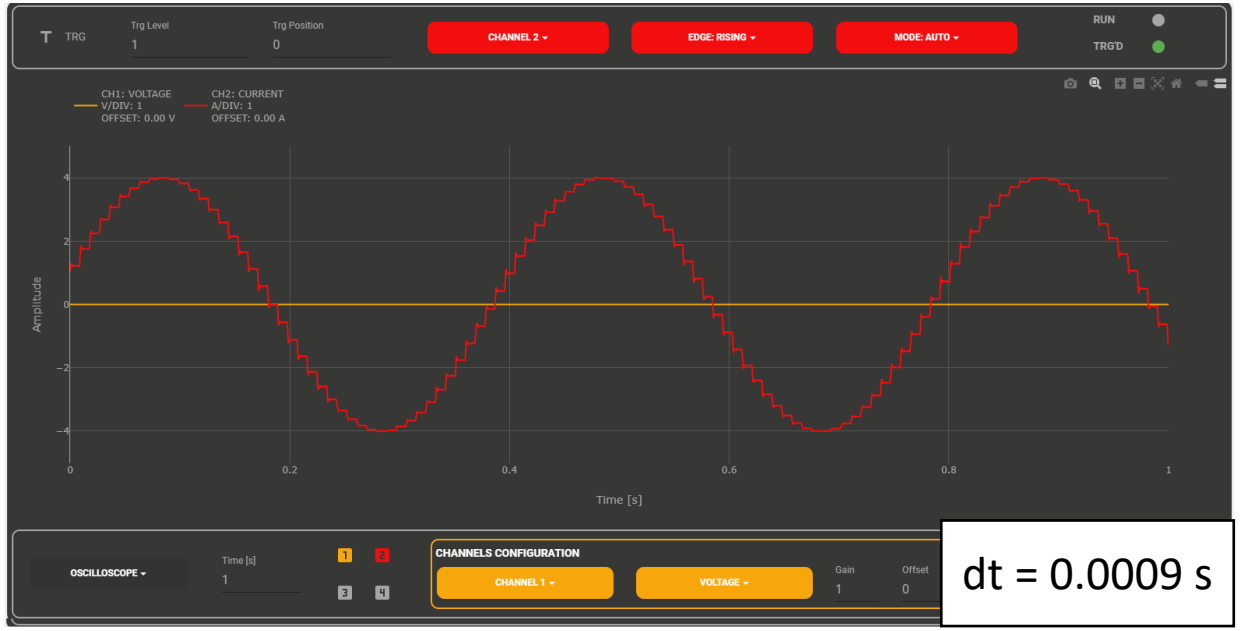
Working with the FPGA





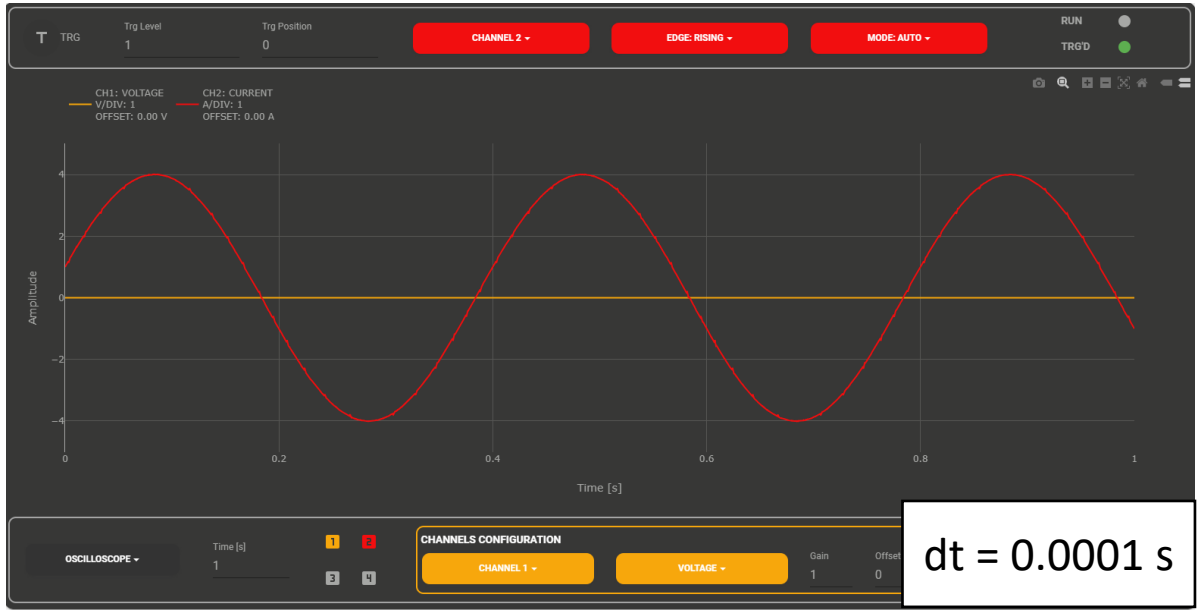
Obtained waveform

dt = 0.05 s



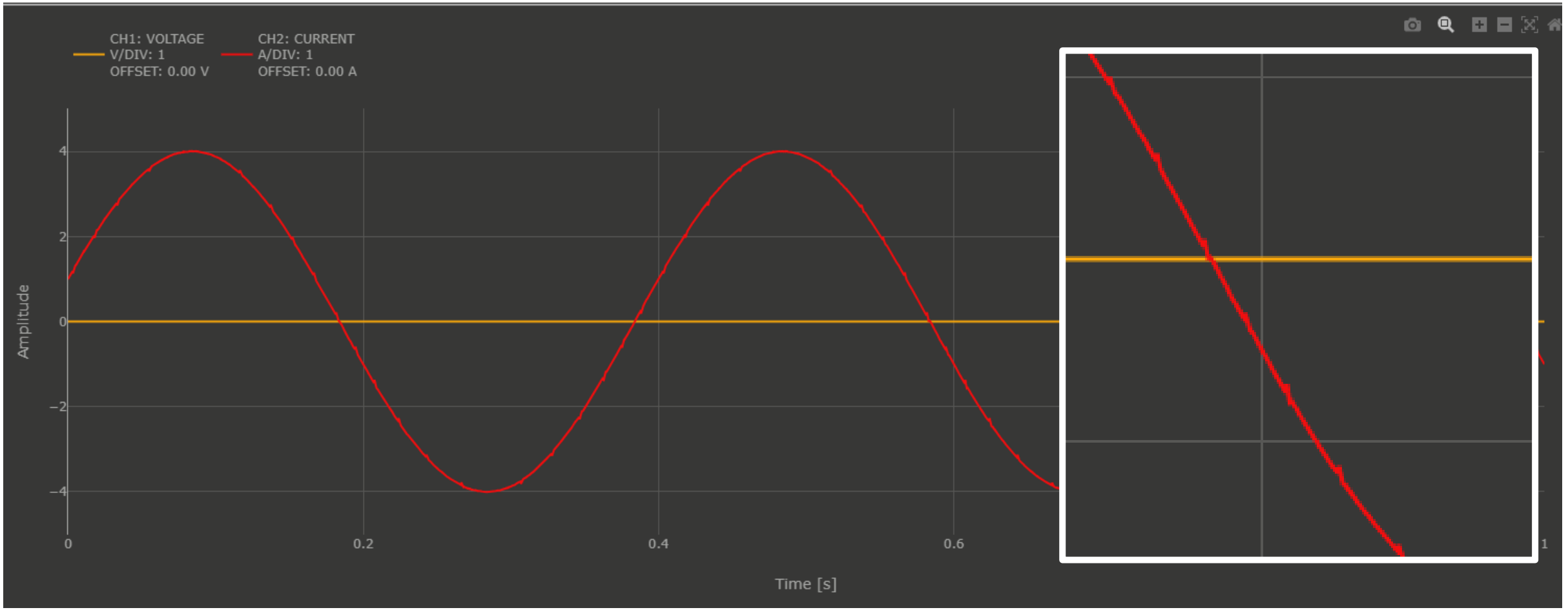
dt = 0.0009 s

dt = 0.02 s



dt = 0.0001 s

Obtained waveform



Result!

But we have some glitches….

State of a project

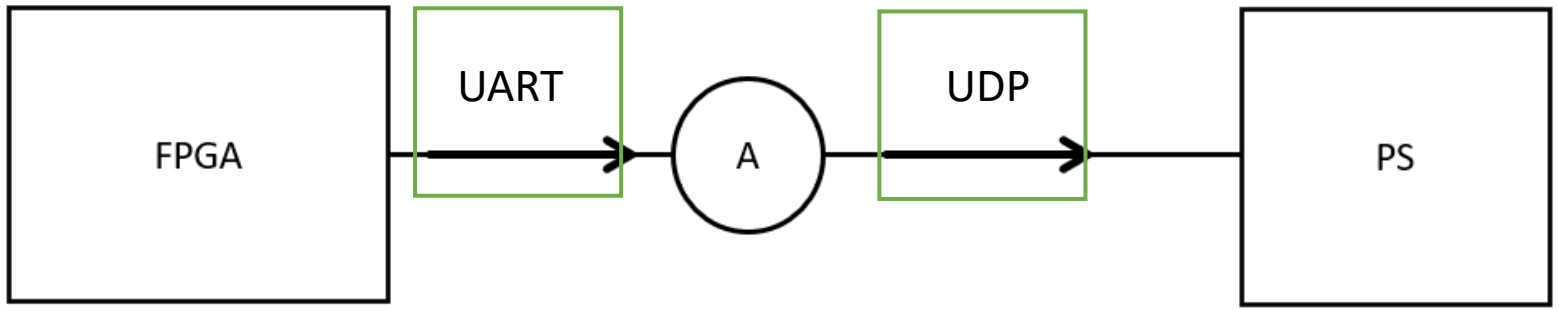
Done:

Arduino – Power supply
UDP communication

UART message generator in Labview

UART message receiver for Arduino

UDP package creator
(receives a setpoint from the FPGA and constructs a UDP package)

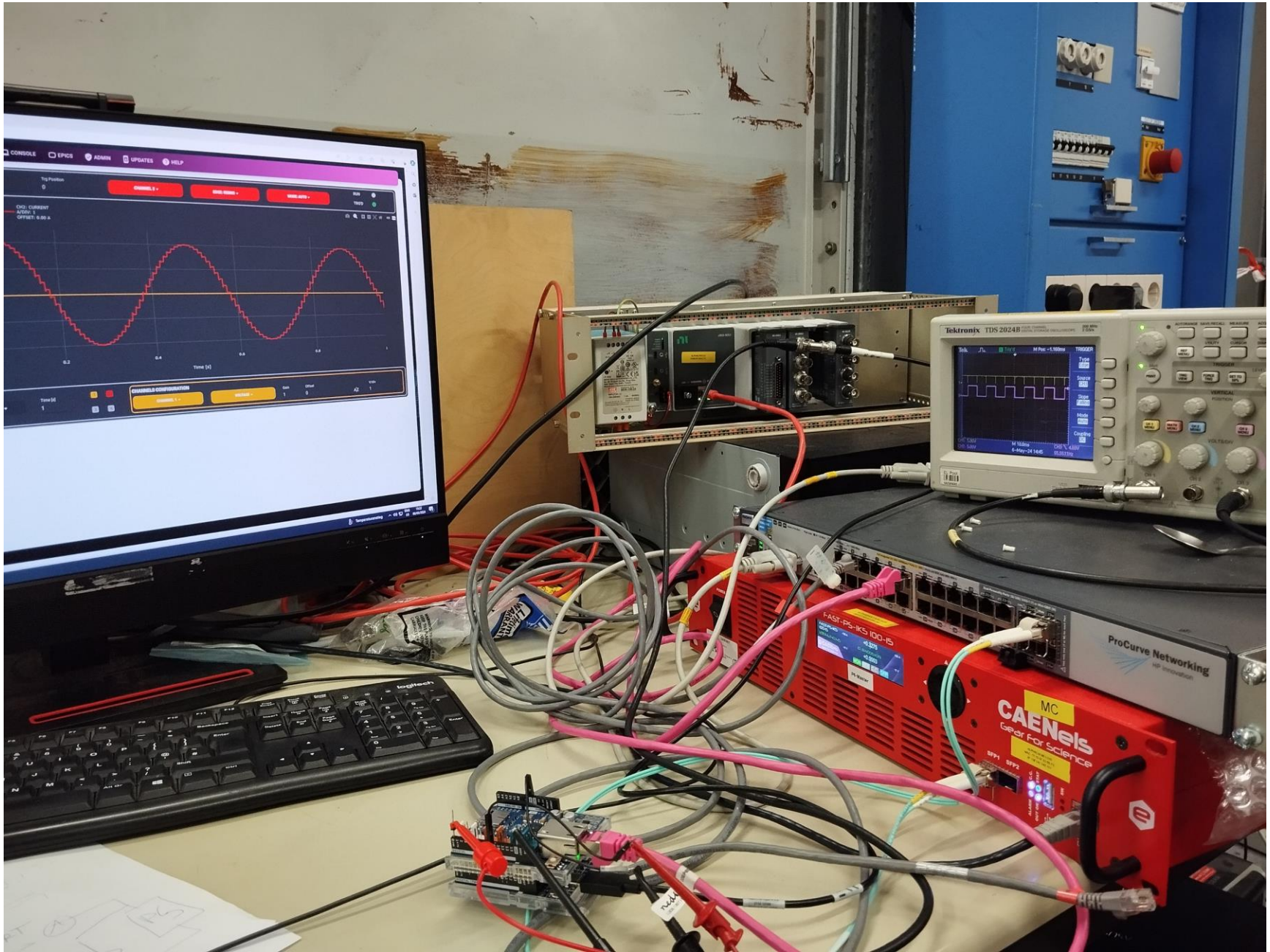


More to do:

Glitch fixing

Code optimization

Final setup


Tektronix TDS 2024B
ProCurve Networking
CAENels
Gear For Science
logitech

Thanks for your attention :)