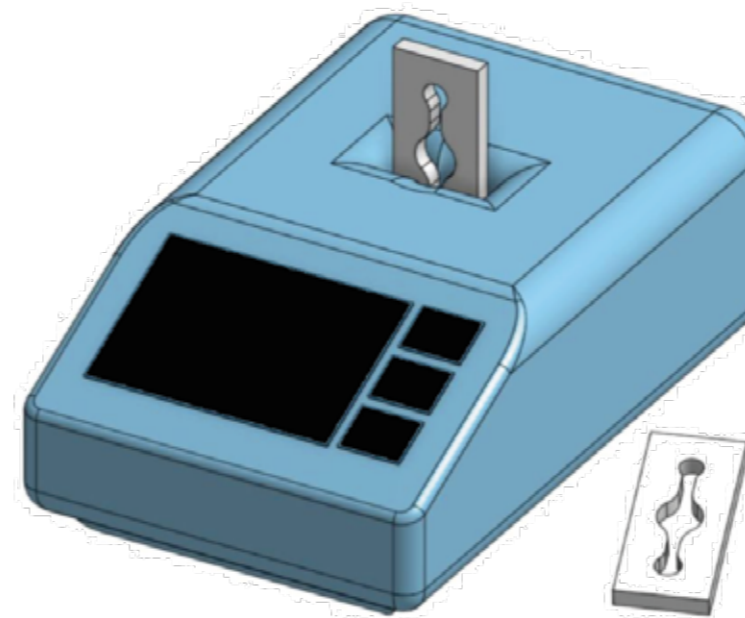
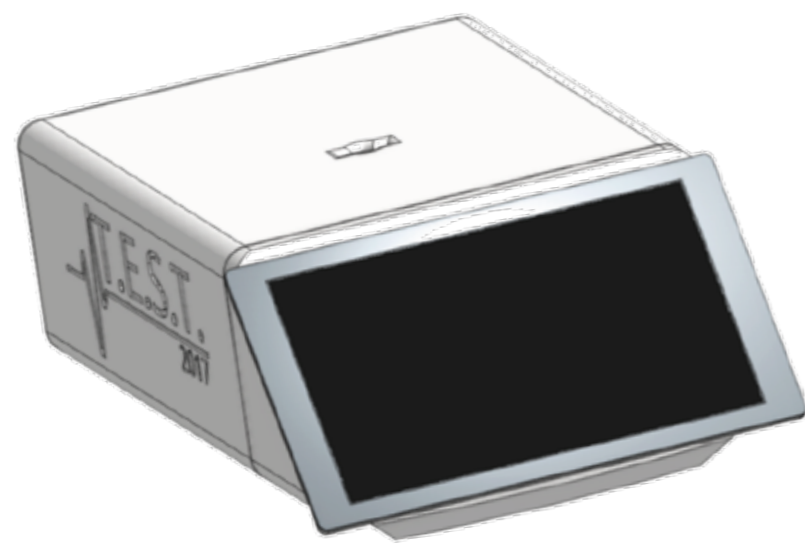


Hardware Sensor

Analyser



Prototype Specifications

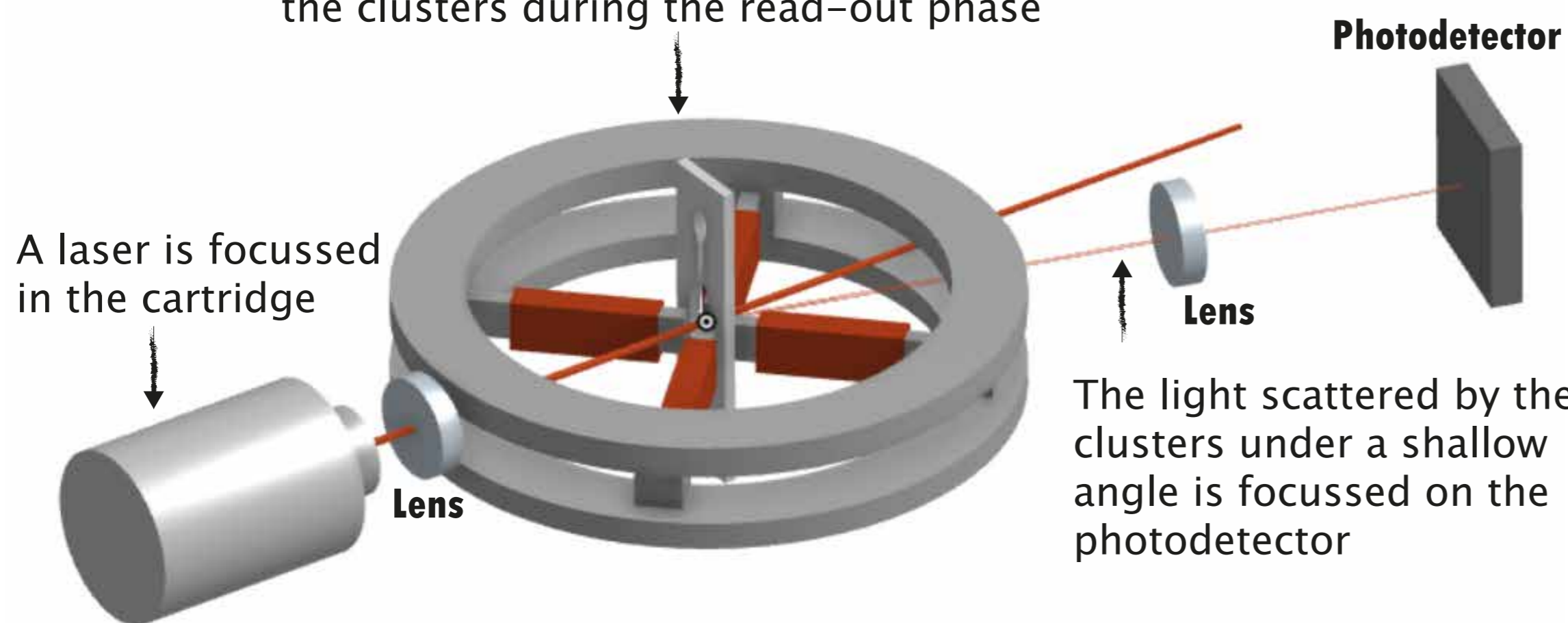
dimensions: 20 x 30 x 10 cm
Laser power: 70 mW
Power consumption: ...

Next Phase

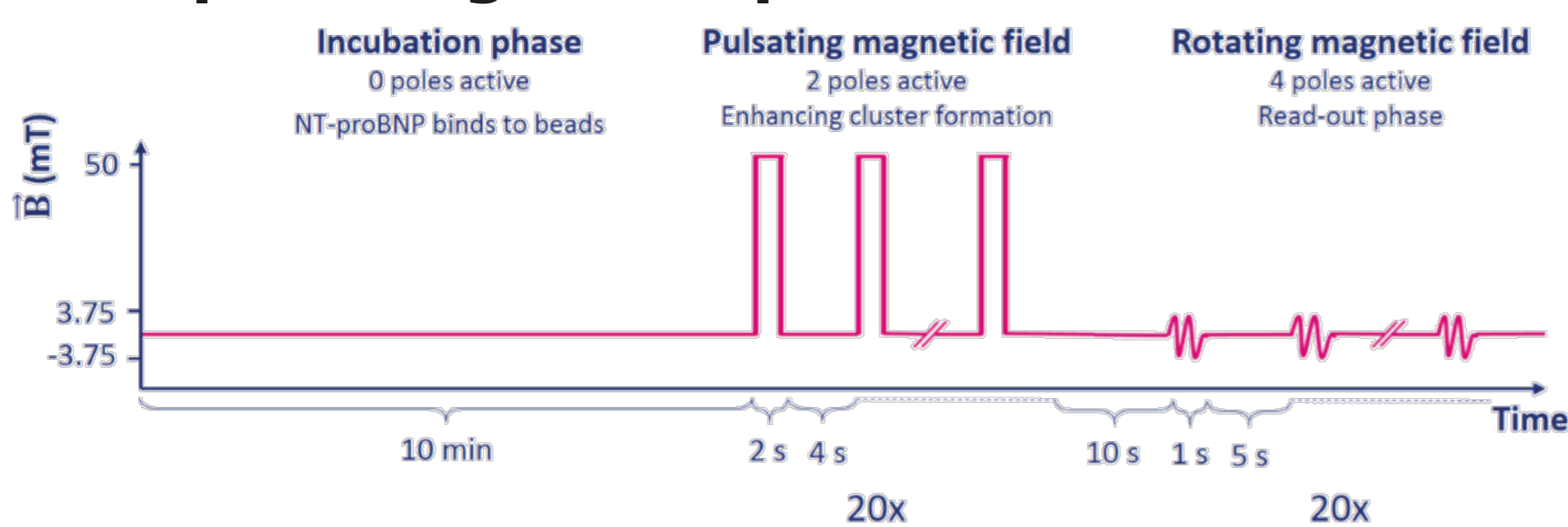
- Dimensions: 10x15x7 cm
- Include a battery
- Include a wireless communication component

Inside of the Sensor

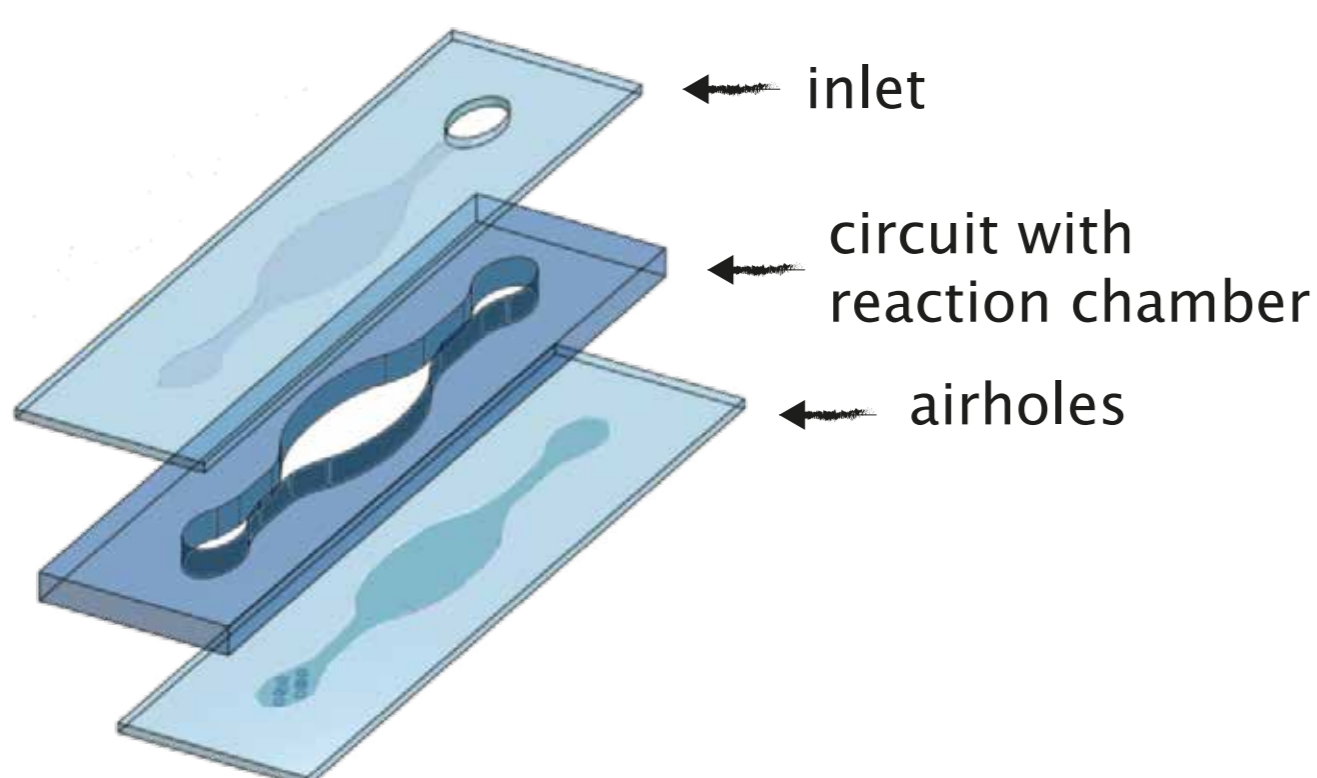
The Quadrupole electromagnet is used to manipulate the movement of the beads, promoting cluster formation and rotating the clusters during the read-out phase



Quadrupole Magnet Sequence



Cartridge



The sample is inserted via the inlet and travels to the reaction chamber via capillary transport, which is accomplished by the hydrophilic layer and the airholes. The dark planes in the image represent the hydrophilic layer

Prototype Specifications

dimensions: ... x ... x 1.5 mm
Material: PMMA
Hydrophilization: O₂ plasma
Coating: PPL-PEG

Next Phase

- 6 month stability
- Dried in beads
- Built-in in filter which allows inserting whole blood directly
- Develop cartridges for other biomarkers

Control system

Microcontroller
(1st Arduino DUE)

Amplifier

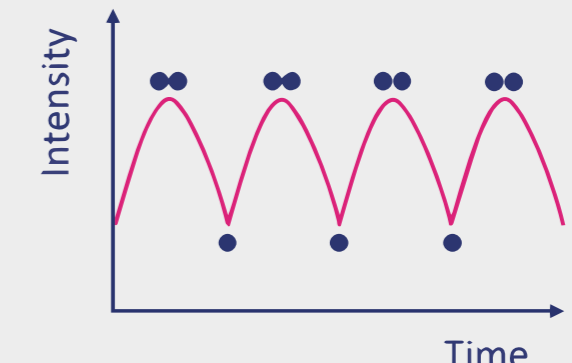
Magnet Poles

Result:
Rotating clusters in the cartridge

Read-out

Laser

Illumination of the rotating cluster, with time varying scattering cross-section, resulting in a time varying scattering intensity



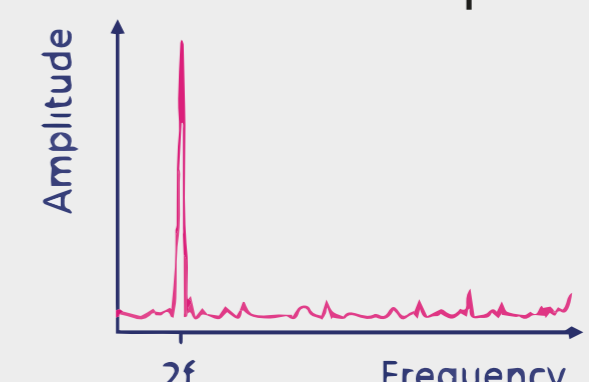
Photodetector

Voltage divider

Microcontroller
(2nd Arduino DUE)

ARM Processor
(Raspberry Pi)

A fast Fourier transform is performed on the signal and the amplitude of the 2f peak is a measure for the clusters, and hence for the concentration NT-proBNP



Touchscreen showing concentration