Low cost proportional chamber readout electronics using the Arduino

Physikalisches Institut

Ruprecht-Karls-Universität Heidelberg

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Jannis Weimar
M. Köhli, U. Schmidt
ANP-PAT

High Voltage supply

nCatcher: Pulse analyzer

Slow-control & Data processing

Detector unit

nCatcher Board

Voltage supply & communication

Pulse monitoring

HV Input

Detector Input
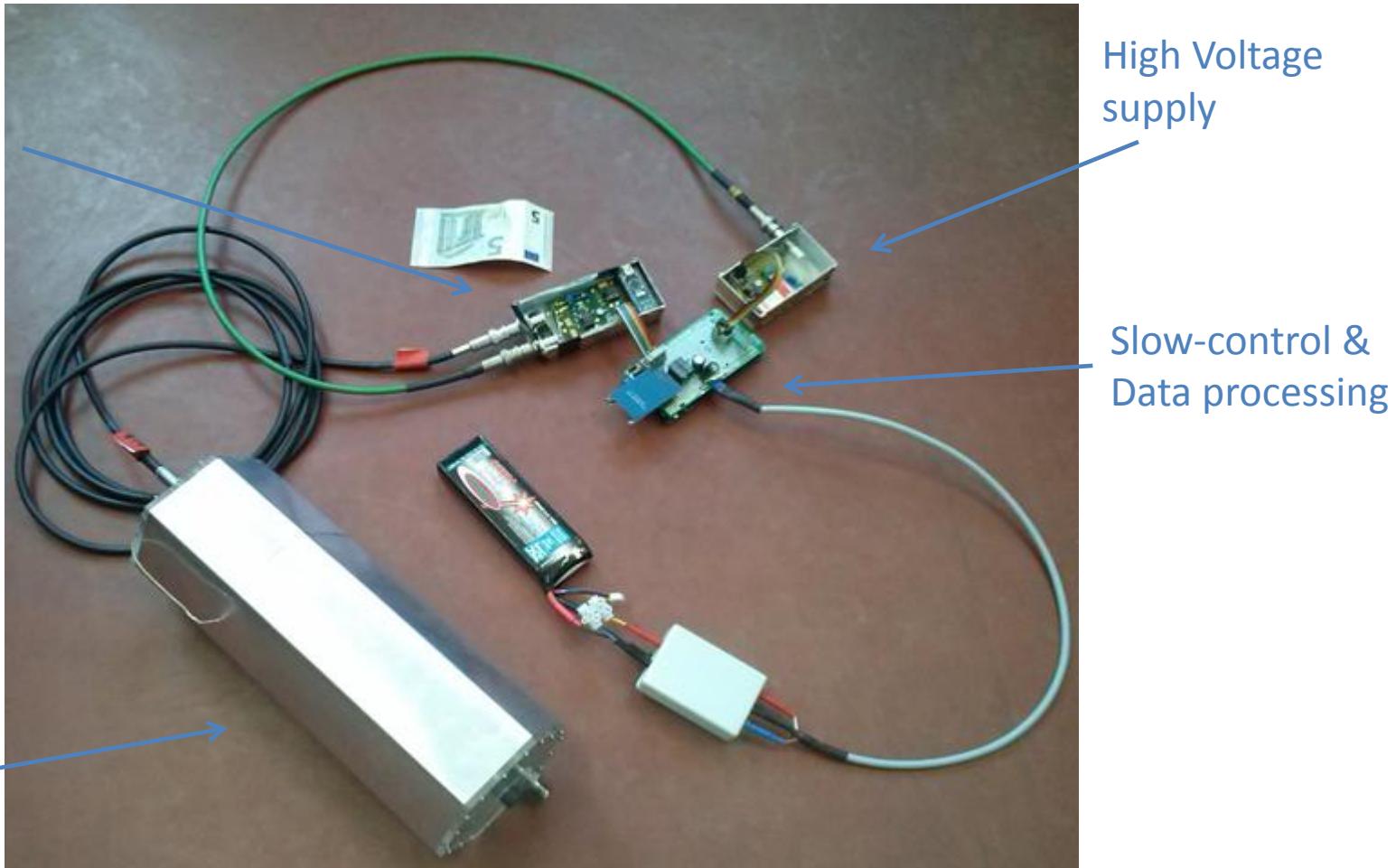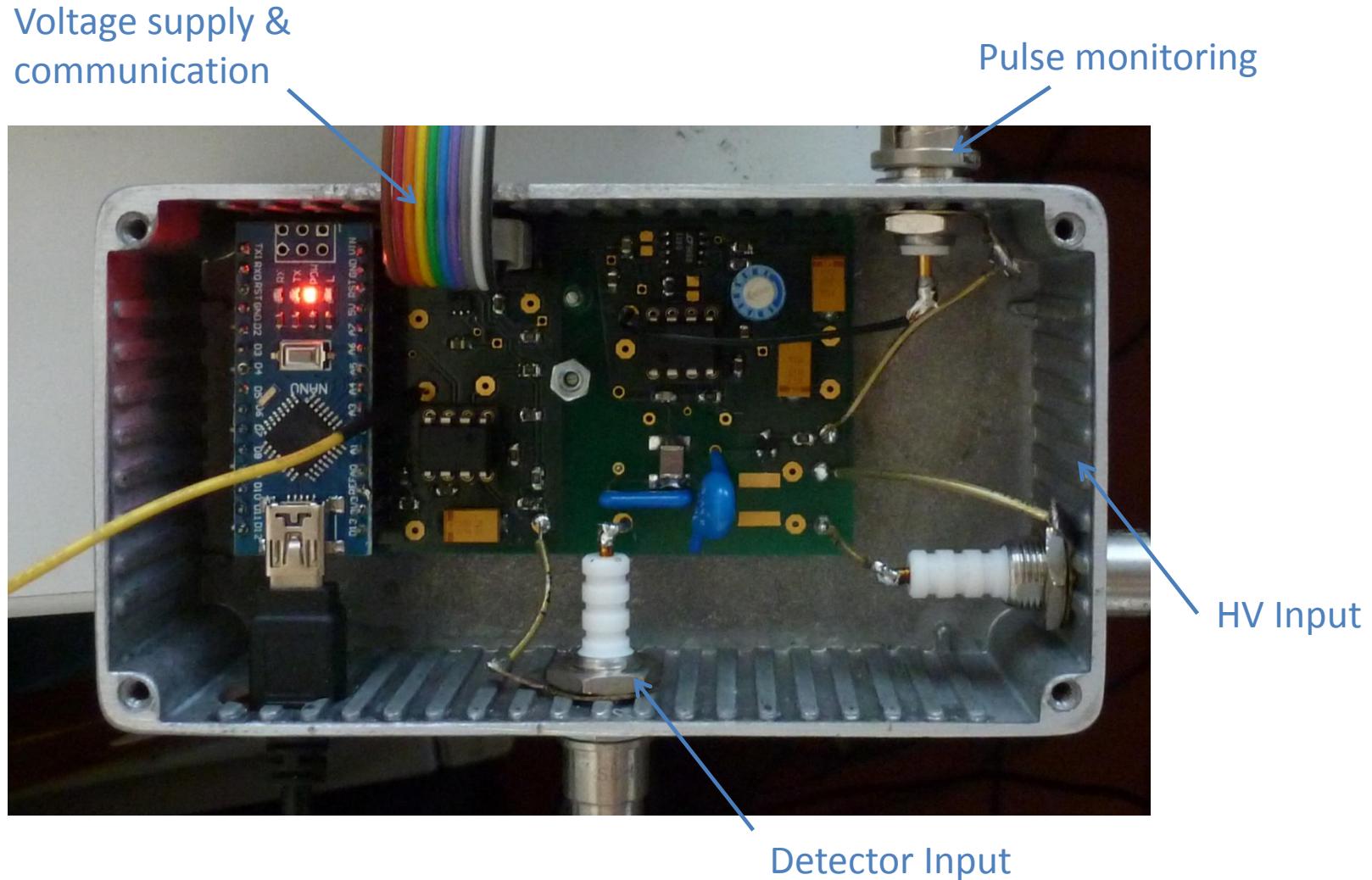
Schematic setup
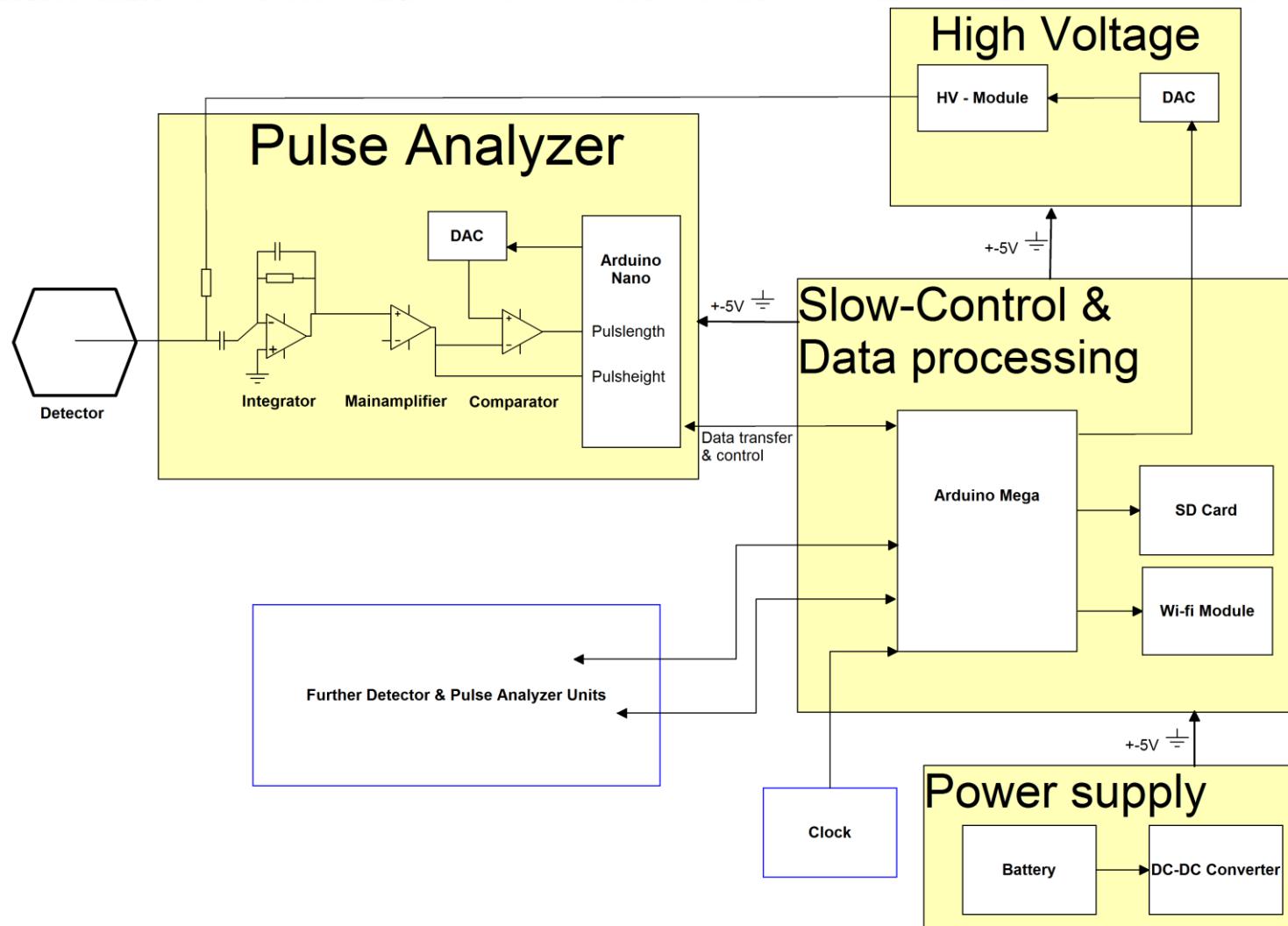
nCatcher Board Features

It's a Pulse Height Analyzer:

- Designed to read out proportional chambers
- Featuring:
  - Integrating Preamplifier + Mainamplifier
  - Comparator (Schmitt-Trigger)
  - Arduino nano
    - Pulse length and pulse height measurements via time over threshold and internal 10-bit ADC
    - Schmitt-Trigger threshold configuration via 12-bit DAC

It's a Single Channel Analyzer:

- Comparator triggers nano's Input Capture Unit (ICU) if a pulse > a THL voltage
- The ICU measures the time for which the THL voltage is exceeded (Pulselength)
- The ICU also triggers the ADC which needs between 250 ns and 16mus to sample the Pulseheight

The Single Channel Analyer
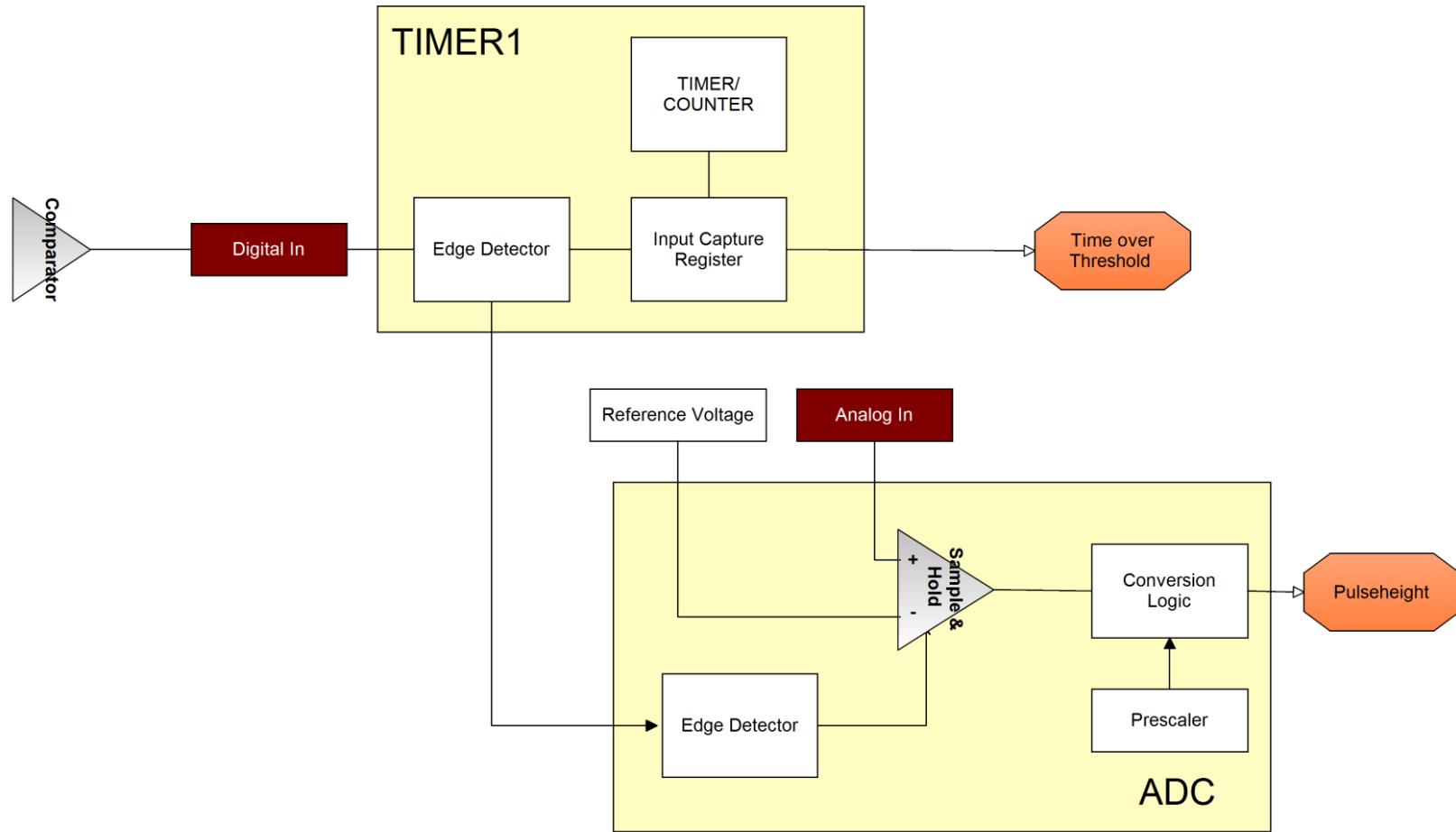
Cost Calculation

Main Components:

PCB: ~20 €
PCB Components: ~15 €
Arduino Nano: ~10 €
Arduino MEGA: ~15 €
Arduino Box: ~10 €

Optional:

Coaxial Cable/Jacks: ~30 €
SD Card and RTC Shield: ~ 25 €
DC-DC Converter: ~ 15€

High Voltage Source:
Actually a lab scale HV source is used. For low cost projects we can also try to find a cheap (low current) solution?

Contact

For more detailed information:

Jannis Weimar

weimar@physi.uni-heidelberg.de

I'm always happy to answer questions concerning the nCatcher Board

or

Markus Köhli

koehli@physi.uni-heidelberg.de