Status of the ARC based Module Test System

T. Franke
III. Physikalisches Institut B
RWTH Aachen

Module Test Meeting
January 22nd , 2002

Overview

- **Last Hardware Developments**
  - HV board
  - LED controller
- **Measurements**
  - LEDs with fibres
  - Characterization of errors

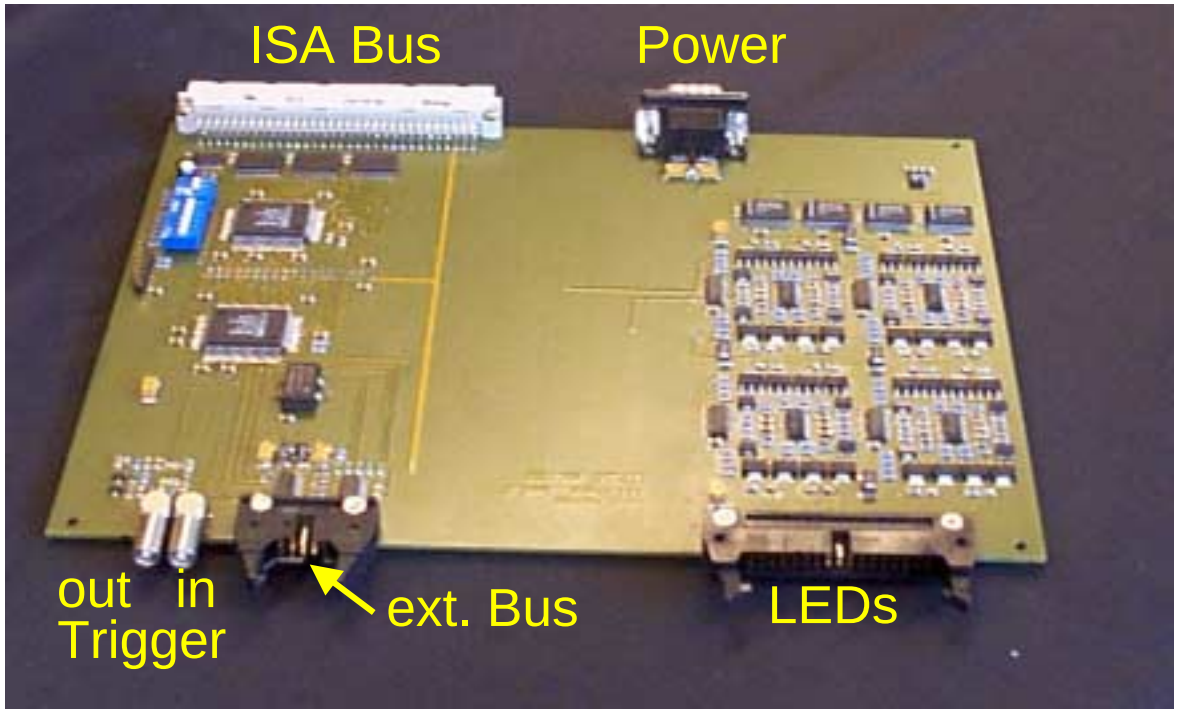
ARC LED Controller (Prototype)

- controls 16 LEDs
- variable pulse length
  0…15 times 25 ns
- variable intensity (8 bit)
- three trigger modes:
  - software
  - external
  - internal (auto repeat mode)
- uses the same ISA interface as the ARC board

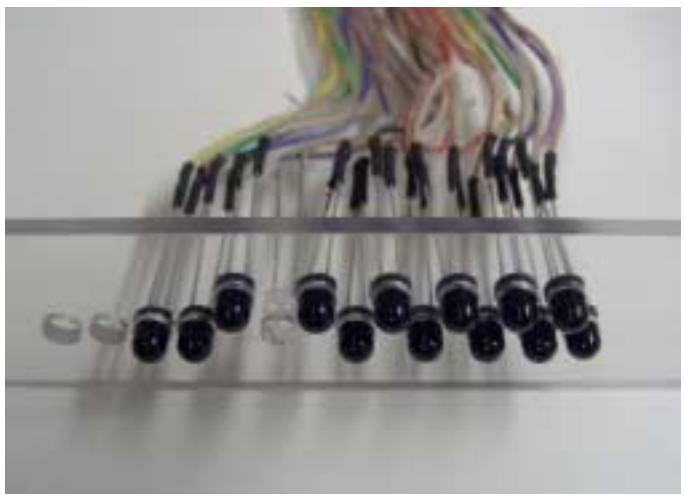
LEDs

- OSRAM SFH 4501 (Strasbourg)
  - Wavelength : 950 nm
  - half angle : 7°
  - switching time : 10 ns

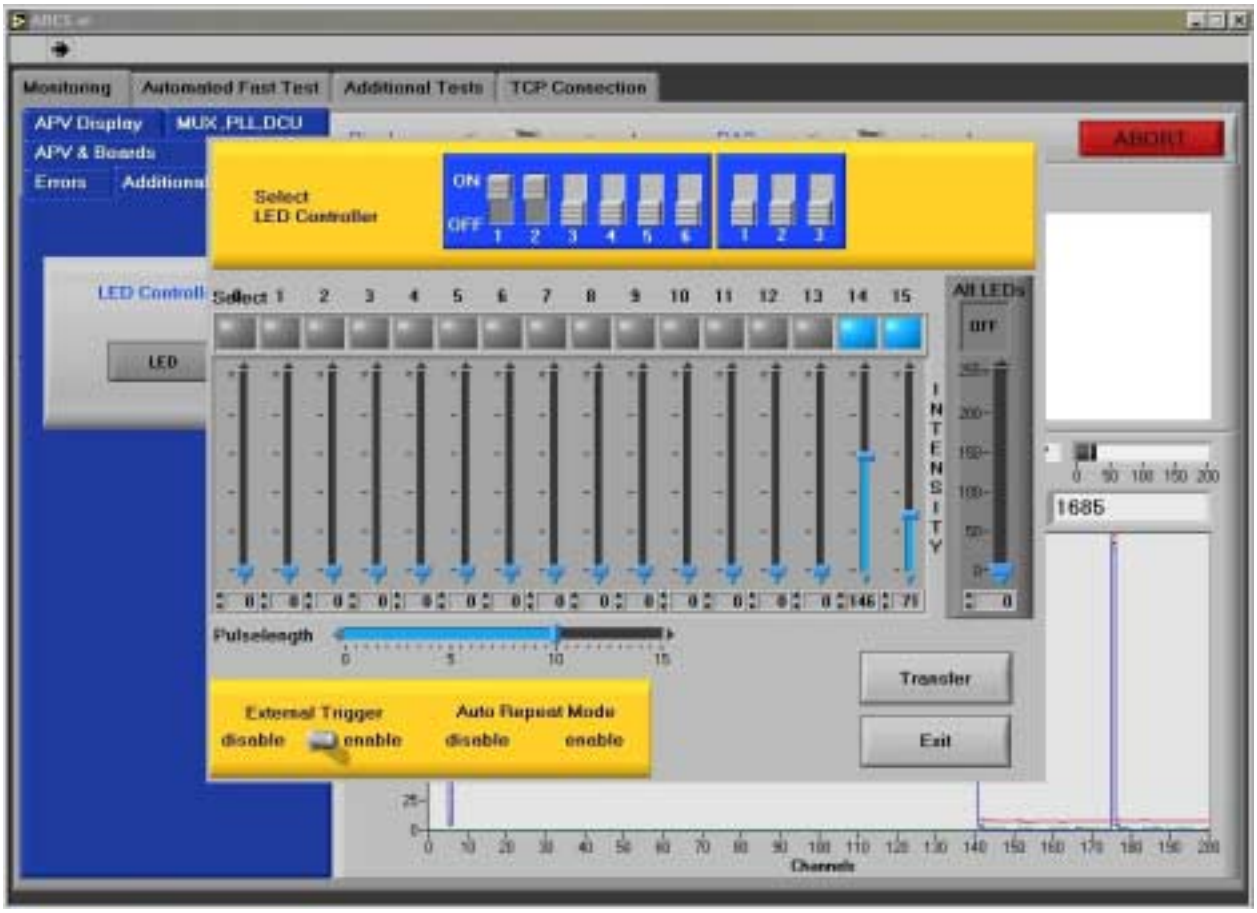
ARC LED Controller



LEDs



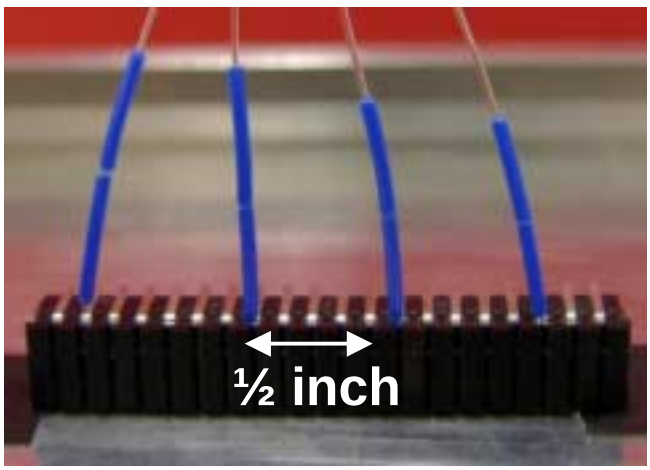
Integration in the ARC*Software*

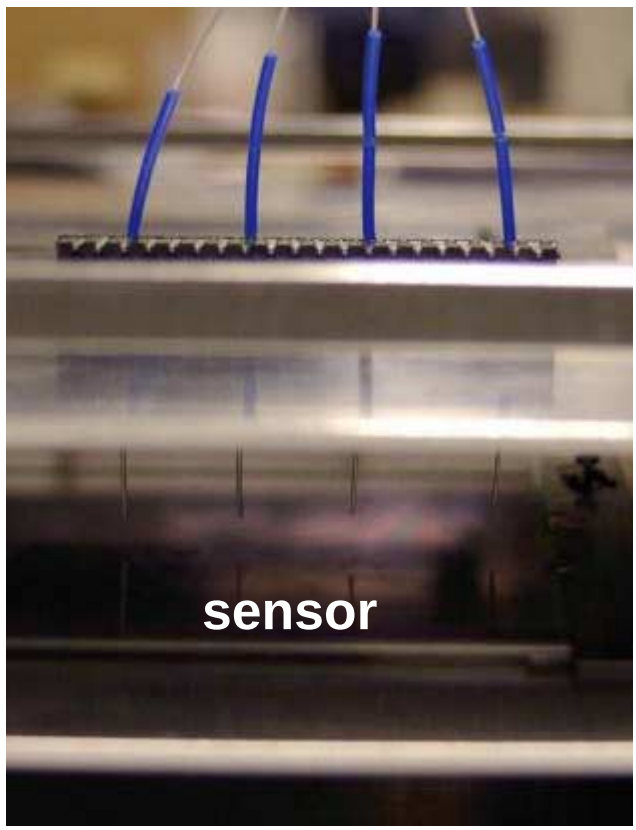


- handling of the LED controller from the same LabVIEW GUI
- integration of coolbox-readout data via TCP connection with coolbox software

Tests with Fibres

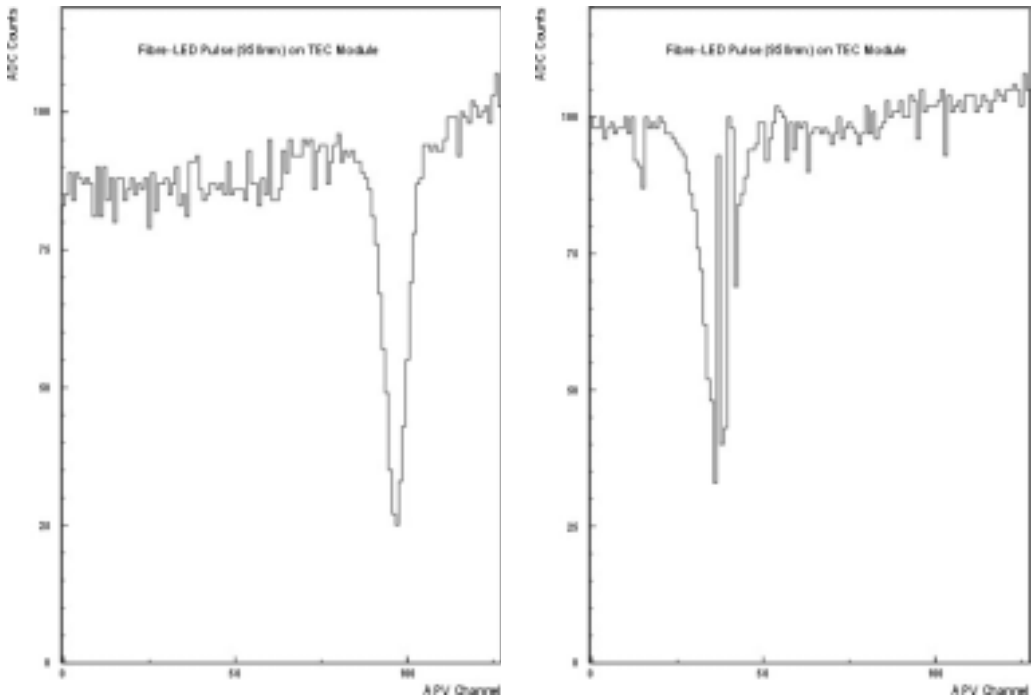
- We coupled four fibres with one LED
- Cut the fibres with scissors



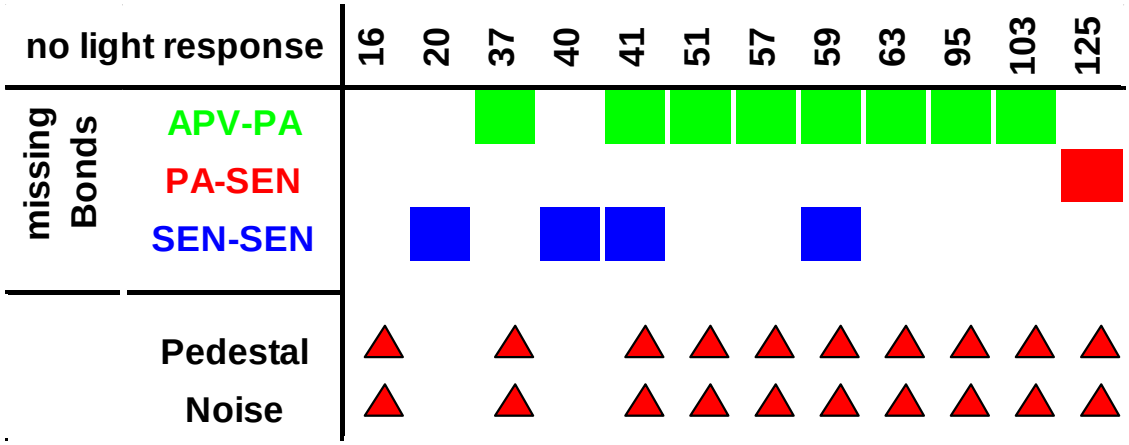


- Guided them quite simple
- Positioned the ends approx. 2 mm above the sensor

Some Results



- Width approx. 15 channels
- Need approx. 16 LEDs (4 or 6 fibres for each LED) to illuminate the complete detector
- Example for error association for one APV (0x40) :



HV Board (DEPP)

Uses the same ISA interface as the ARC system does

- Specifications:
  - Voltage:
    0 – 600 Volts with 12 bit resolution
    (150 mV per count)
  - Current Regulation:
    0 – 20 μA with 12 bit resolution
    (5 nA per count)
  - Implemented actions on overcurrents
    → Current regulation
    → Switch off voltage
    → Switch off voltage on external trigger
- Voltage is potential free

SUMMARY:

- ✓ ARC LED controller
- ✓ HV:
  - ✓ prototype to supply one module ready
  - • two channel device under development
- ✓ Both integrated in *ARC*Software
- ☺ First measurements with fibres are promising

Visit our new designed homepage:

http://www.physik.rwth-aachen.de/group/IIIphys/CMS/tracker/en/index.html